



Direct View LCD

42LG60



LG

Life's Good

Fall 2008

OUTLINE

Section 1

Contact Information, Preliminary Matters, Specifications,
LCD Overview, General Troubleshooting Steps,
Signal Distribution, Disassembly Instructions and Voltages

Section 2

Circuit Board Operation, Troubleshooting of :

- Switch mode Power Supply
- Main Board
- Control Board
- T-CON Board
- Ft Control Board

42LG60 LCD Direct View Display

Section 1

This Section will cover Contact Information and remind the Technician of Important Safety Precautions for the Customers Safety as well as the Technician and the Equipment.

Basic Troubleshooting Techniques which can save time and money sometimes can be overlooked. These techniques will also be presented.

This Section will get the Technician familiar with the Disassembly, Identification and Layout of the LCD Display Panel.

At the end of this Section the Technician should be able to Identify the Circuit Boards and have the ability and knowledge necessary to safely remove and replace any Circuit Board or Assembly.

Preliminary Matters (The Fine Print)

IMPORTANT SAFETY NOTICE

The information in this training manual is intended for use by persons possessing an adequate background in electrical equipment, electronic devices, and mechanical systems. In any attempt to repair a major Product, personal injury and property damage can result. The manufacturer or seller maintains no liability for the interpretation of this information, nor can it assume any liability in conjunction with its use. When servicing this product, under no circumstances should the original design be modified or altered without permission from LG Electronics. Unauthorized modifications will not only void the warranty, but may lead to property damage or user injury. If wires, screws, clips, straps, nuts, or washers used to complete a ground path are removed for service, they must be returned to their original positions and properly fastened.

CAUTION

To avoid personal injury, disconnect the power before servicing this product. If electrical power is required for diagnosis or test purposes, disconnect the power immediately after performing the necessary checks. Also be aware that many household products present a weight hazard. At least two people should be involved in the installation or servicing of such devices. Failure to consider the weight of an product could result in physical injury.

ESD Notice (Electrostatic Discharge Notice)

Today's sophisticated electronics are electrostatic discharge (ESD) sensitive. ESD can weaken or damage the electronics in a manner that renders them inoperative or reduces the time until their next failure. Connect an ESD wrist strap to a ground connection point or unpainted metal in the product. Alternatively, you can touch your finger repeatedly to a ground connection point or unpainted metal in the product. Before removing a replacement part from its package, touch the anti-static bag to a ground connection point or unpainted metal in the product. Handle the electronic control assembly by its edges only. When repackaging a failed electronic control assembly in an anti-static bag, observe these same precautions.

REGULATORY INFORMATION

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential installation. This equipment generates, uses, and can radiate radio frequency energy, and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures: Reorient or relocate the receiving antenna; Increase the separation between the equipment and the receiver; Connect the equipment to an outlet on a different circuit than that to which the receiver is connected; or consult the dealer or an experienced radio/TV technician for help.

CONTACT INFORMATION

Customer Service (and Part Sales) (800) 243-0000

Technical Support (and Part Sales) (800) 847-7597

USA Website (GCSC) aic.lgservice.com

Customer Service Website us.lgservice.com

LG Web Training lge.webex.com

LG CS Academy lgcsacademy.com <http://136.166.4.200>

LCD-DV:	32LG40, 32LH30, 42LG60, 42LG70, 42LH20, 42LH40, 42LH50, 47LG90
PLASMA:	42PG20, 42PQ20, 42PQ30, 50PG20, 50PS80, 50PS60

*Also available on the
Plasma page*

**Plasma Panel
Alignment Handbook**

*New Training Materials on
the Learning Academy site*

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**LG Electronics Alabama, Inc. 201
James Record Road, Huntsville,
AL, 35813.**



Safety and Handling and Checking Points

Safety and Handling Regulations

1. Approximately 20 minute pre-run time is required before any adjustments are performed.
2. Refer to the Voltage Sticker on the Switch Mode Power Supply silk screening. (+/- ½ volt).
3. Be cautious of electric shock from the Backlight section, it uses high voltage AC. Check that the Power Supply and Drive Circuits are completely discharged because of residual current stored before Circuit Board removal.
4. C-MOS circuits are sensitive to static electricity.
Use caution when dealing with these IC and circuits.
5. Exercise care when making voltage and waveform checks to prevent costly short circuits from damaging the unit.
6. Be cautious of lost screws and other metal objects to prevent a possible short in the circuitry.

Checking Points to be Considered

1. Check the appearance of the Replacement Panel and Circuit Boards for both physical damage and part number accuracy.
2. Check the model label. Verify model names and board model matches.
3. Check details of defective condition and history. Example: Oscillator failure dead set, etc...

Basic Troubleshooting Steps

Define, Localize, Isolate and Correct

•**Define** Look at the symptom carefully and determine what circuits could be causing the failure. Use your senses Sight, Smell, Touch and Hearing. Look for burned parts and check for possible overheated components. Capacitors will sometimes leak dielectric material and give off a distinct odor. Frequency of power supplies will change with the load, or listen for relay closing etc. **Observation of the front Power LED may give some clues.**

•**Localize** After carefully checking the symptom and determining the circuits to be checked and after giving a thorough examination using your senses the first check should always be the DC Supply Voltages to those circuits under test. Always confirm the supplies are not only the proper level but be sure they are noise free. If the supplies are missing check the resistance for possible short circuits.

•**Isolate** To further isolate the failure, check for the proper waveforms with the Oscilloscope to make a final determination of the failure. Look for correct Amplitude Phasing and Timing of the signals also check for the proper Duty Cycle of the signals. Sometimes “glitches” or “road bumps” will be an indication of an imminent failure.

•**Correct** The final step is to correct the problem. Be careful of ESD and make sure to check the DC Supplies for proper levels. Make all necessary adjustments and lastly always perform a Safety AC Leakage Test before returning the product back to the Customer.

42LG60 PRODUCT INFORMATION SECTION



This section of the manual will discuss the specifications of the 42LG60
“Thin” LCD Direct View Display Panel.

Basic Specifications

- **Full HD 1080p Resolution (1920 x 1080)**
- **50,000:1 Dynamic Contrast Ratio**
- **TruMotion 120Hz**
- **4x HDMI™ V.1.3 with Deep Color**
- **Intelligent Sensor**
- **24p Real Cinema**
- **AV Mode (Cinema, Sports, Game)**
- **Clear Voice**
- **LG SimpLink™ Connectivity**
- **Invisible Speaker System**
- **USB 2.0 (JPEG, MP3)**
- **ISFccc**

LOGO Familiarization



Full HD 1080p Resolution

Displays HDTV programs in full 1920 x 1080p resolution for a more detailed picture.



TruMotion 120Hz

Advance 120Hz panel provides clear, smooth images, even during fast action scenes creating a stable structure for a crisper picture.



Intelligent Sensor

Unlike other sensors which can only sense brightness of ambient light, LG's "Intelligent Sensor" uses 4,096 sensing steps to evaluate its surroundings. Using a sophisticated algorithm, the LG processes picture quality elements including brightness, contrast, color, sharpness and white balance. The result is a picture optimized for it's surroundings, more pleasing to watch and which can also save up to 50% in power consumption.



24p Real Cinema

Hi-def movies run at exactly 24 frames per second speed that they were originally filmed in, making your home-cinema experience one step closer to a "Real Cinema" experience.



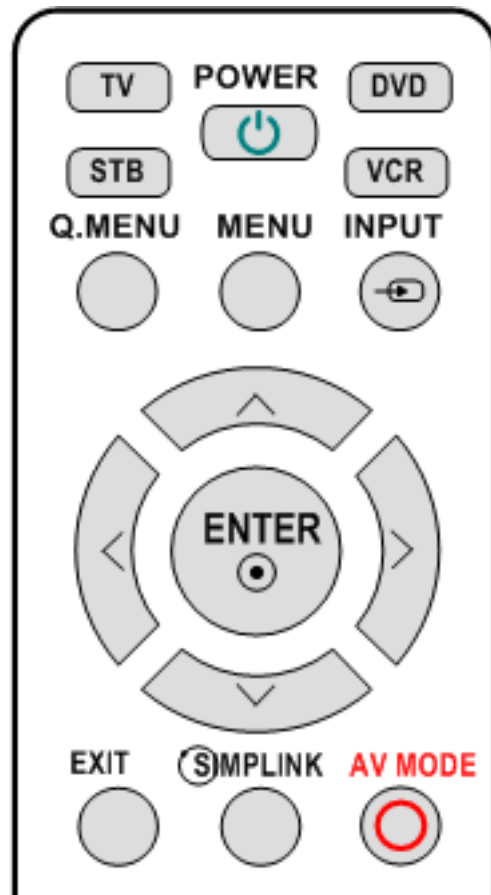
Clear Voice Technology

Automatically enhances and amplifies the sound of the human voice frequency range to provide high-quality dialogue when background noise swells.

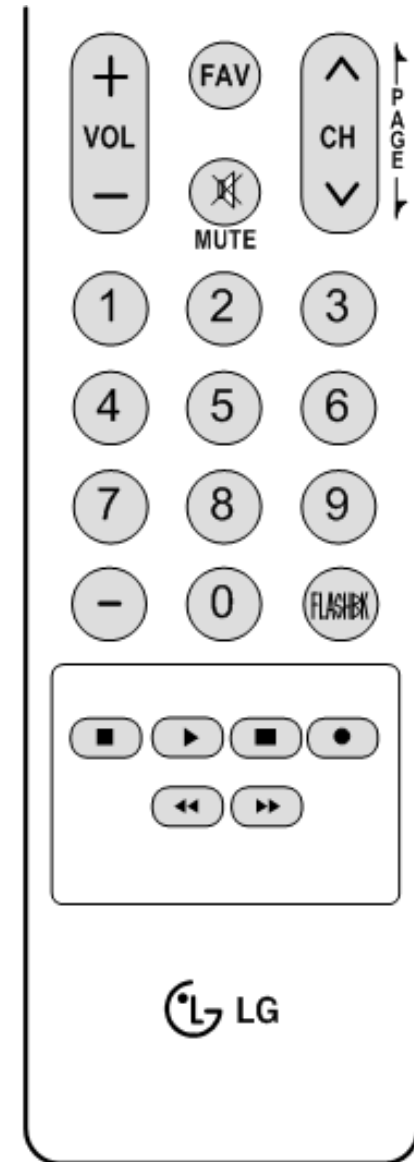


Remote Control

TOP PORTION

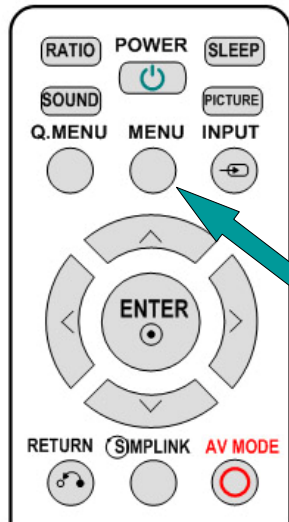


BOTTOM PORTION



Accessing the Service Menu

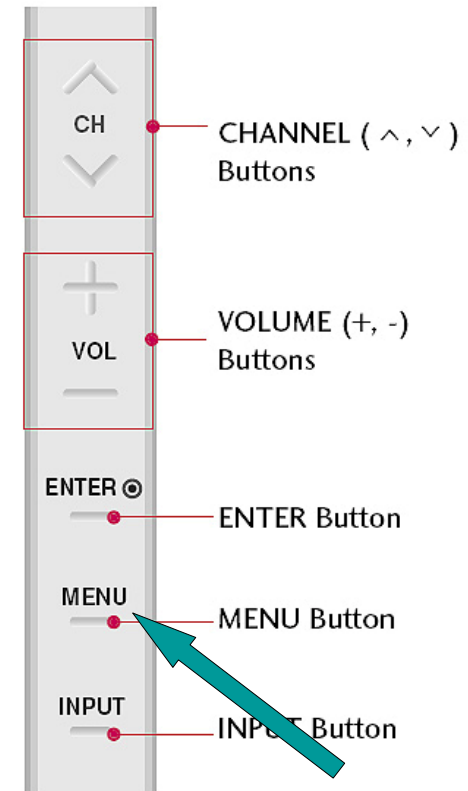
REMOTE TOP PORTION



To access the Service Menu.

- 1) Turn the Set On
- 2) Simultaneously, Press and “Hold” the Menu Key on the Side Key pad and Press and “Hold” the Menu Key on the Remote approximately 5 seconds.
- 3) If Customer’s Menu appears, continue to hold until it disappears.
- 4) The Service Menu appears

SIDE KEYS



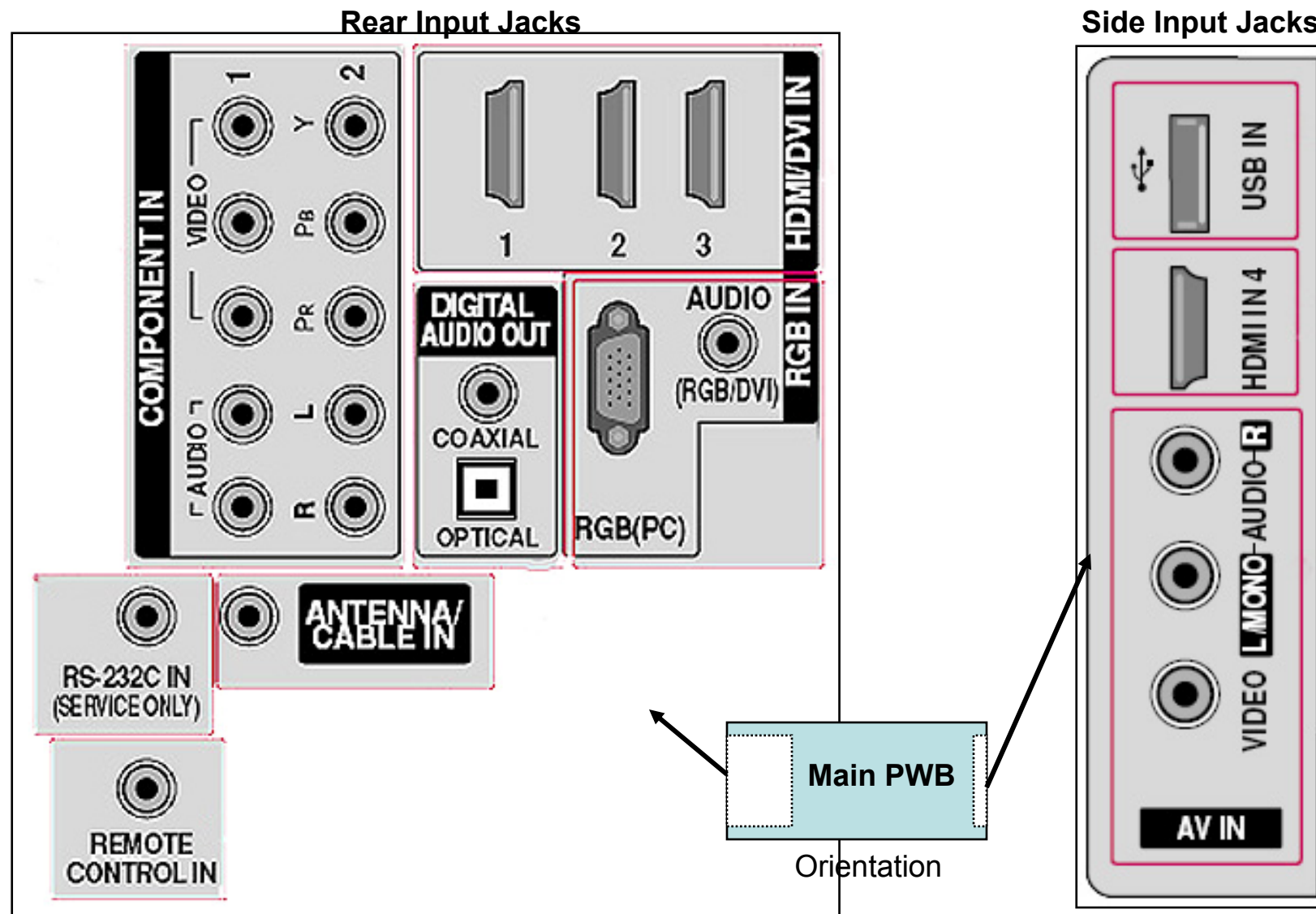
Note: Dependant upon the Software Version, a Password may be required to enter the Service Menu.

If a password is required, enter

0000

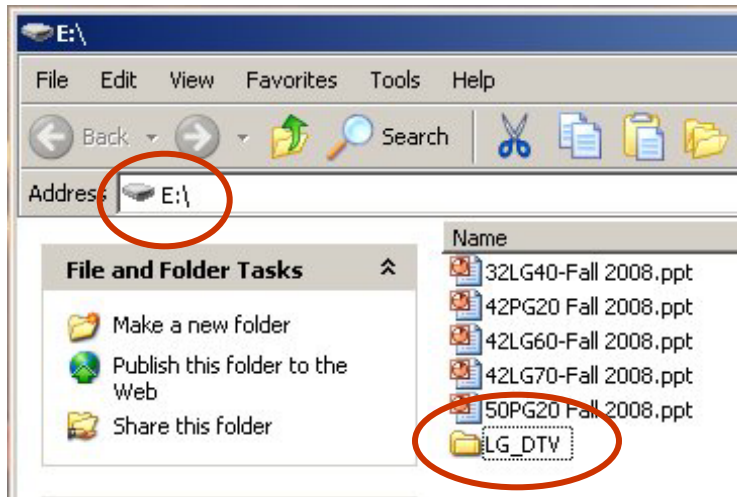


Rear and Side Input Jacks

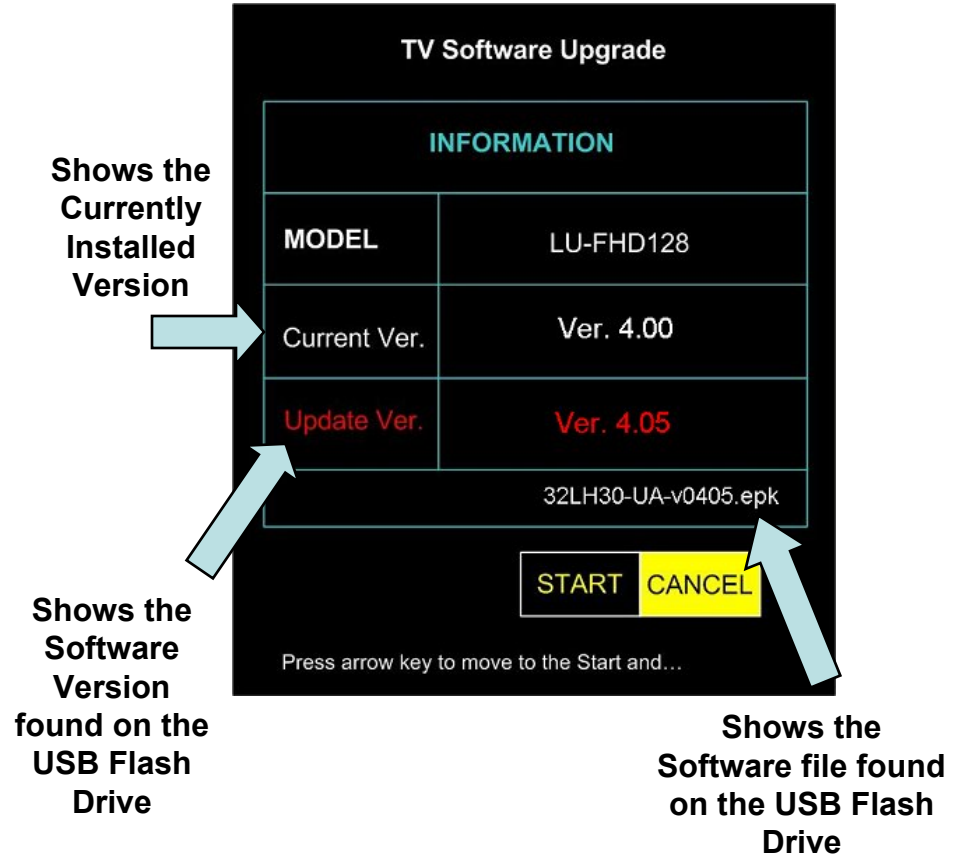


USB Download Screen (Software Update)

1) Create an LG_DTV folder on the USB Flash Drive



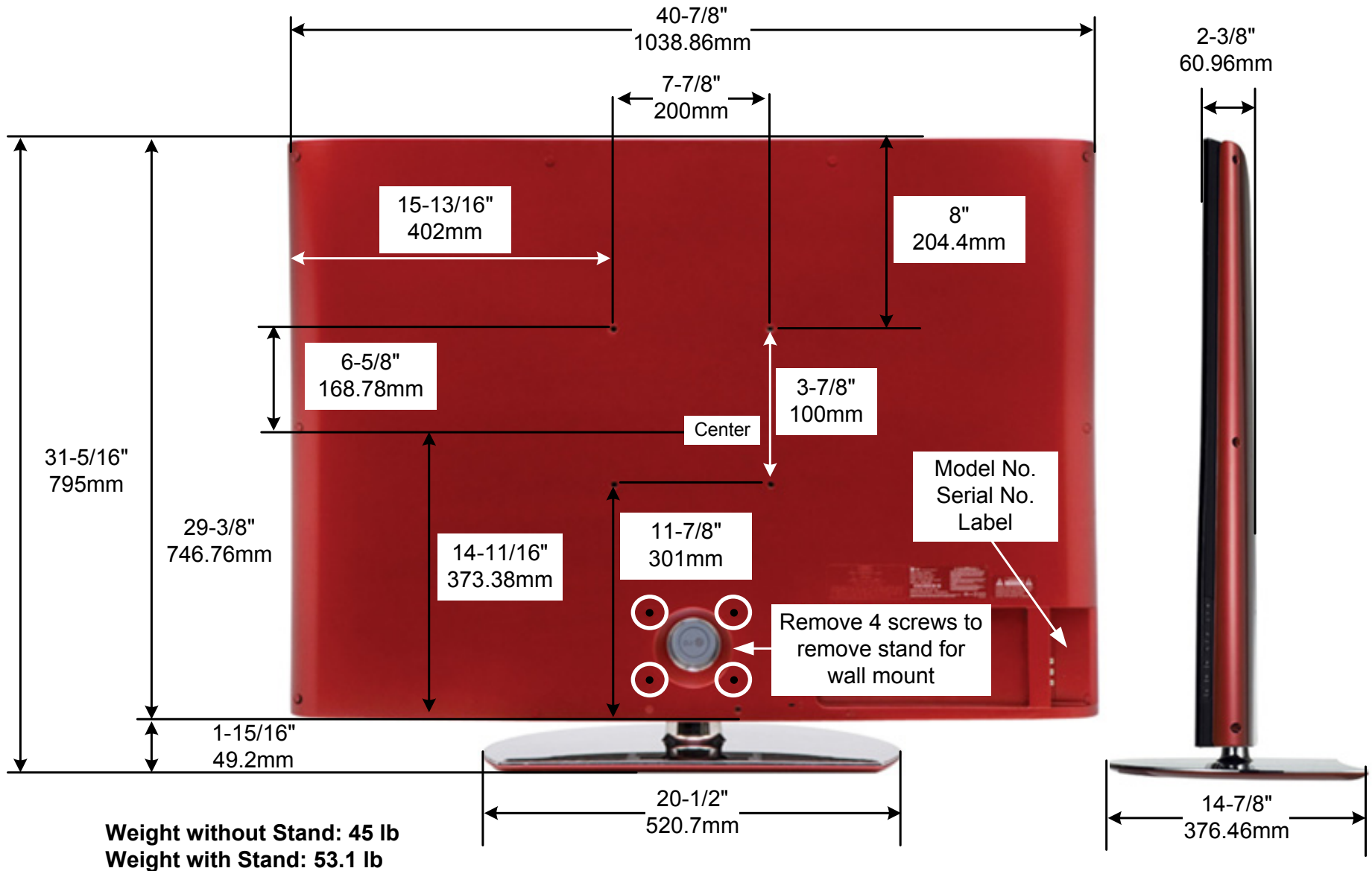
- 2) Copy new software (xxx.epk) to "LG_DTV" folder. Make sure to have correct software file.
- 3) With TV turned on, insert USB flash drive.
- 4) You can see the message "TV Software Upgrade" (See figure to right)
- 5) Cursor left and highlight "START" Button and push "Enter" button using the remote control.
- 6) You can see the download progress Bar.
- 7) Do not unplug until unit has automatically restarted.
- 8) When download is completed, you will see "COMPLETE".
- 9) Your TV will be restarted automatically.



*** CAUTION:**
Do not remove AC power or the USB Flash Drive.
Do not turn off Power, during the upgrade process.

42LG60 Dimensions

There must be at least 4 inches of Clearance on all sides



DISASSEMBLY AND TROUBLESHOOTING SECTION

This section of the manual will discuss disassembly and troubleshooting.

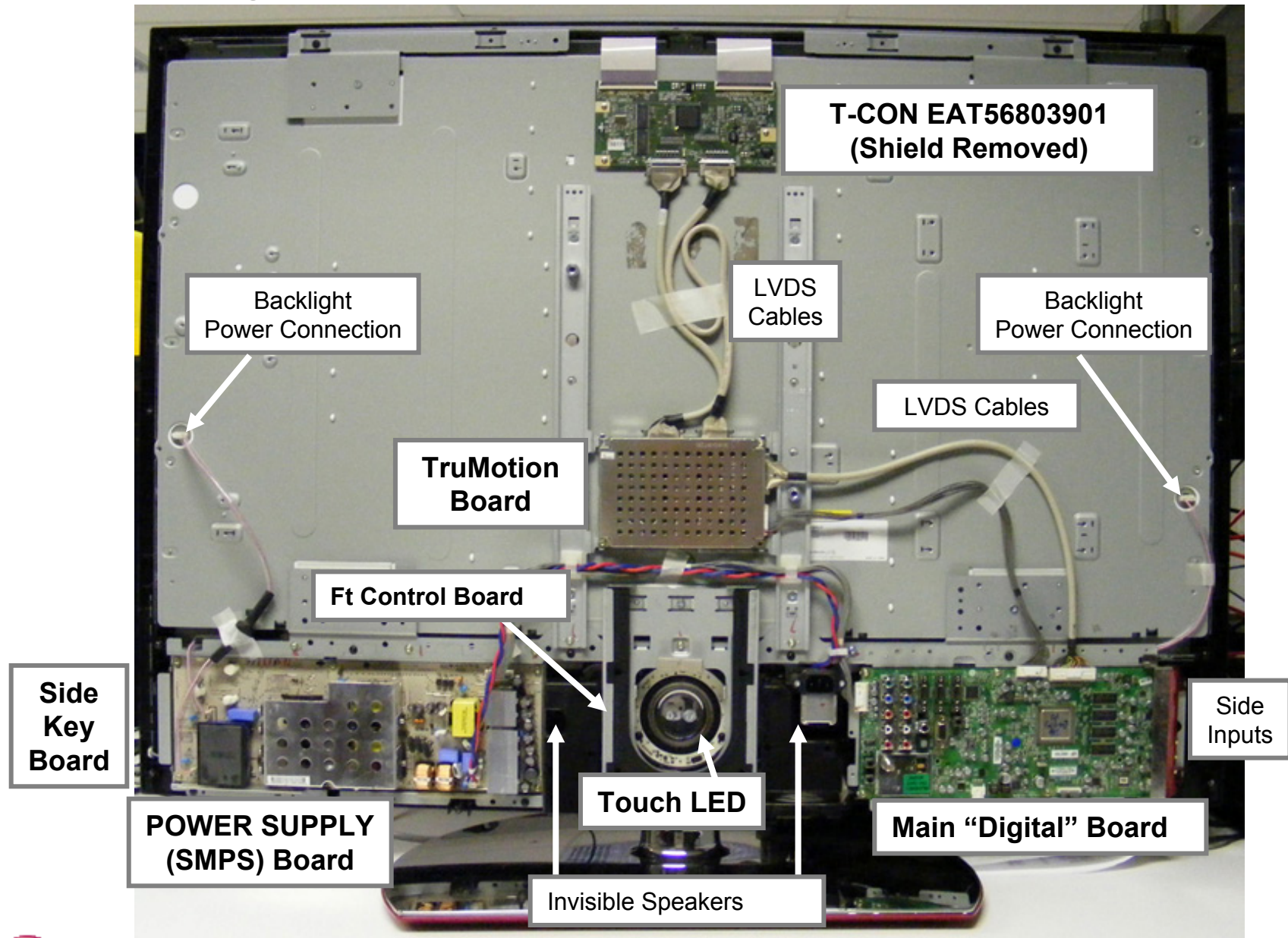


Upon completion of this section the Technician will have a better understanding of how to diagnosis and resolve problems.

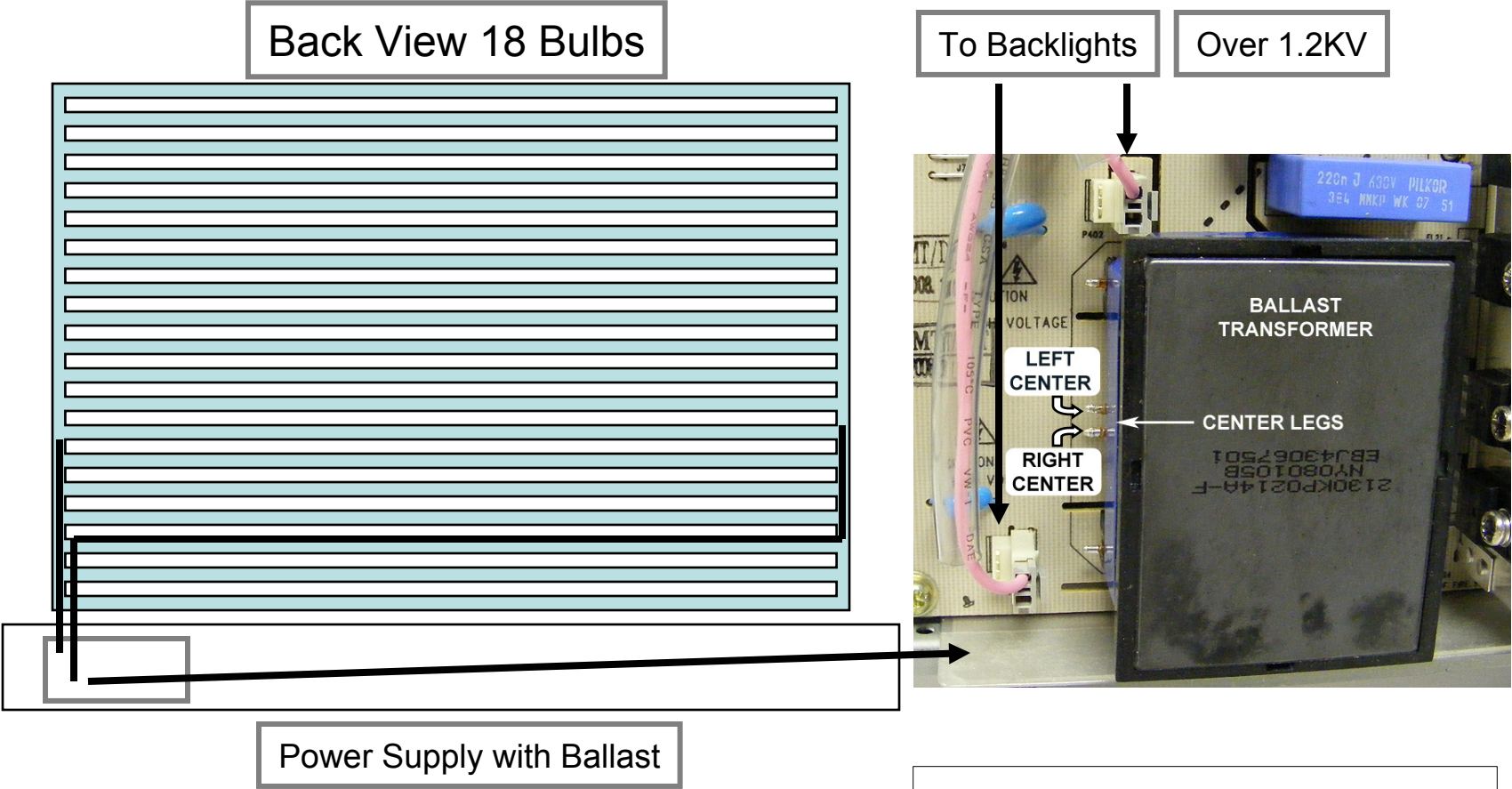
Removing the Back Cover



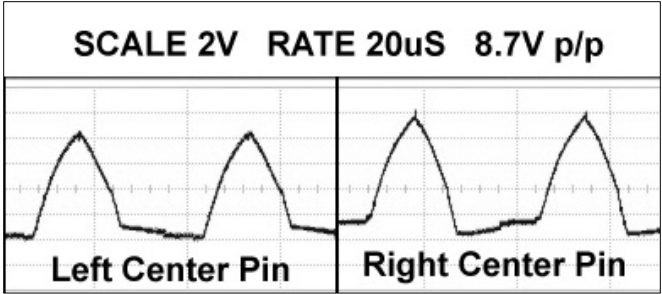
Circuit Board Layout



Backlight Information



EEFL (External Electrode Fluorescent Lamp)
LOW COST Large number of lamps driven by a single inverter

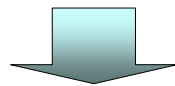
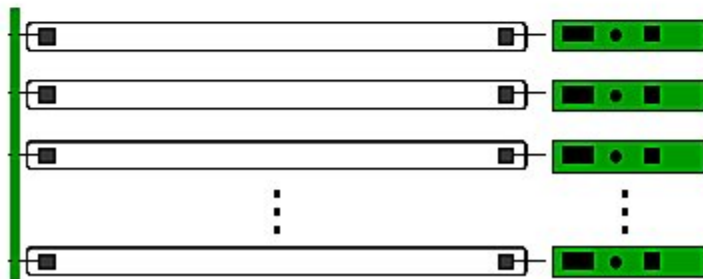
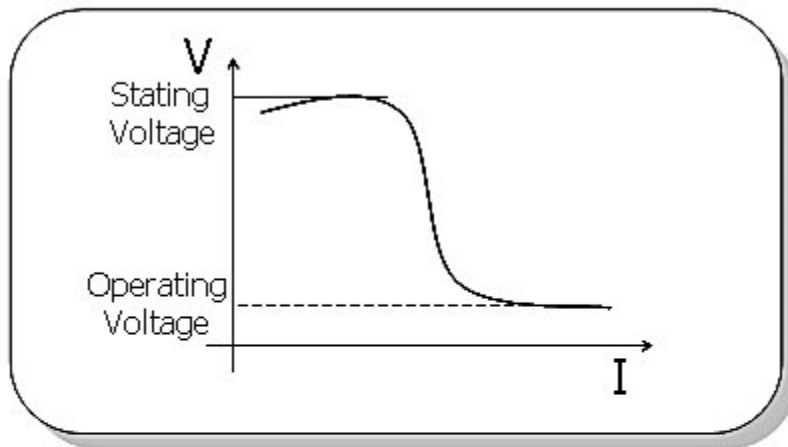


2.8V~3.1V RMS

58Khz

Introducing EEFL and CCFL

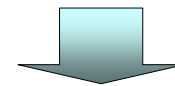
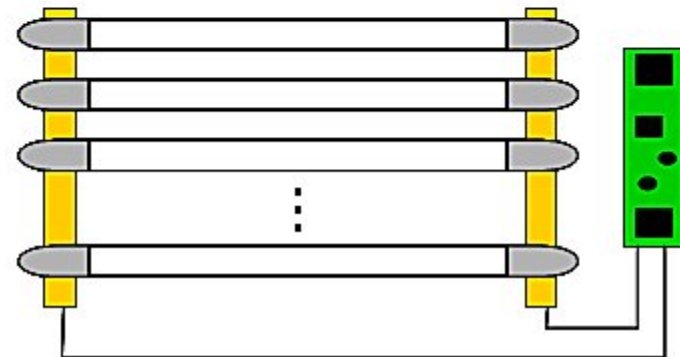
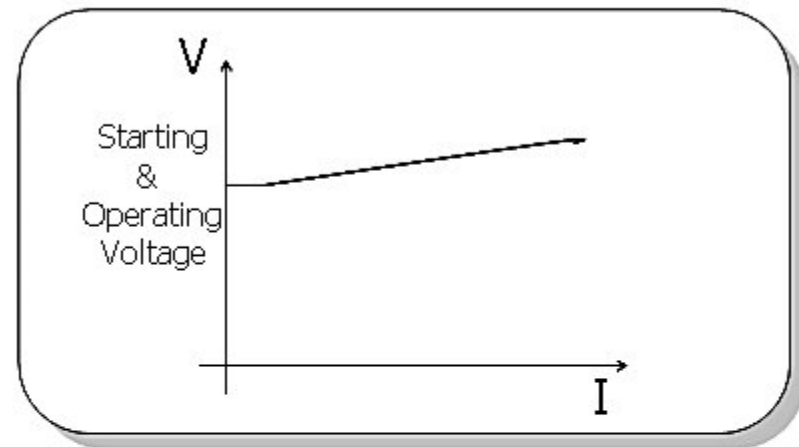
CCFL (Cold Cathode Fluorescent Lamp)



Complicated structure

Simple structure, Low price

EEFL (External Electrode Fluorescent Lamp)



Simple structure

Lamp manufacturing process
Lamp assembly structure

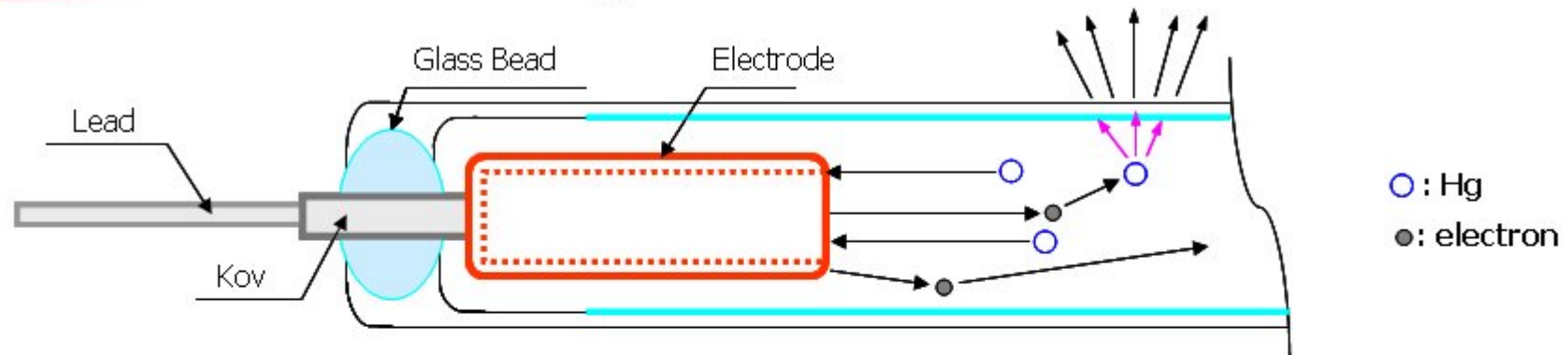
Low Cost

Large number of Lamp
Drive by single inverter

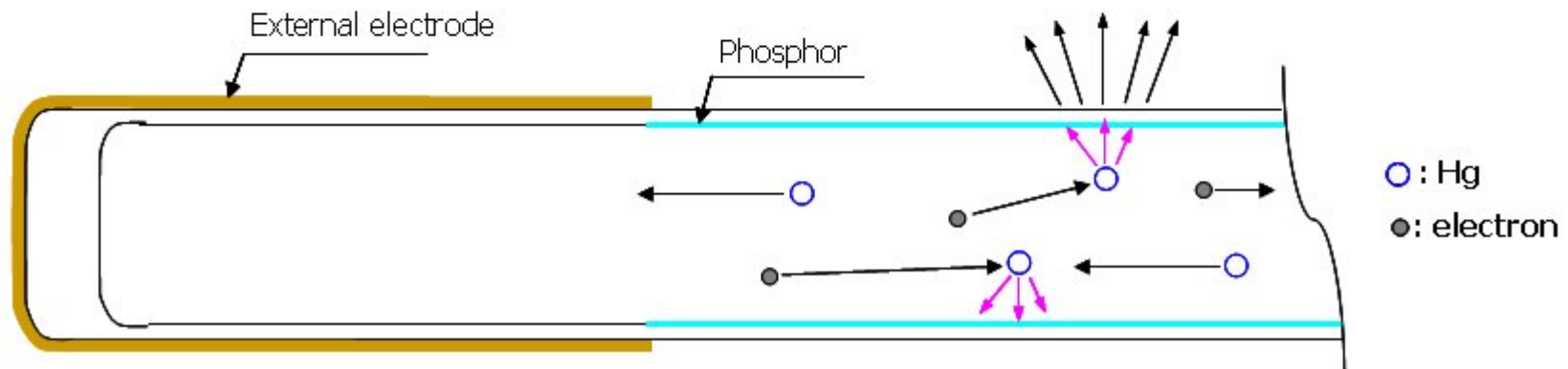
Electrode Differences between the EEFL and CCFL

Key: Long Life Time

CCFL (Cold Cathode Fluorescent Lamp)

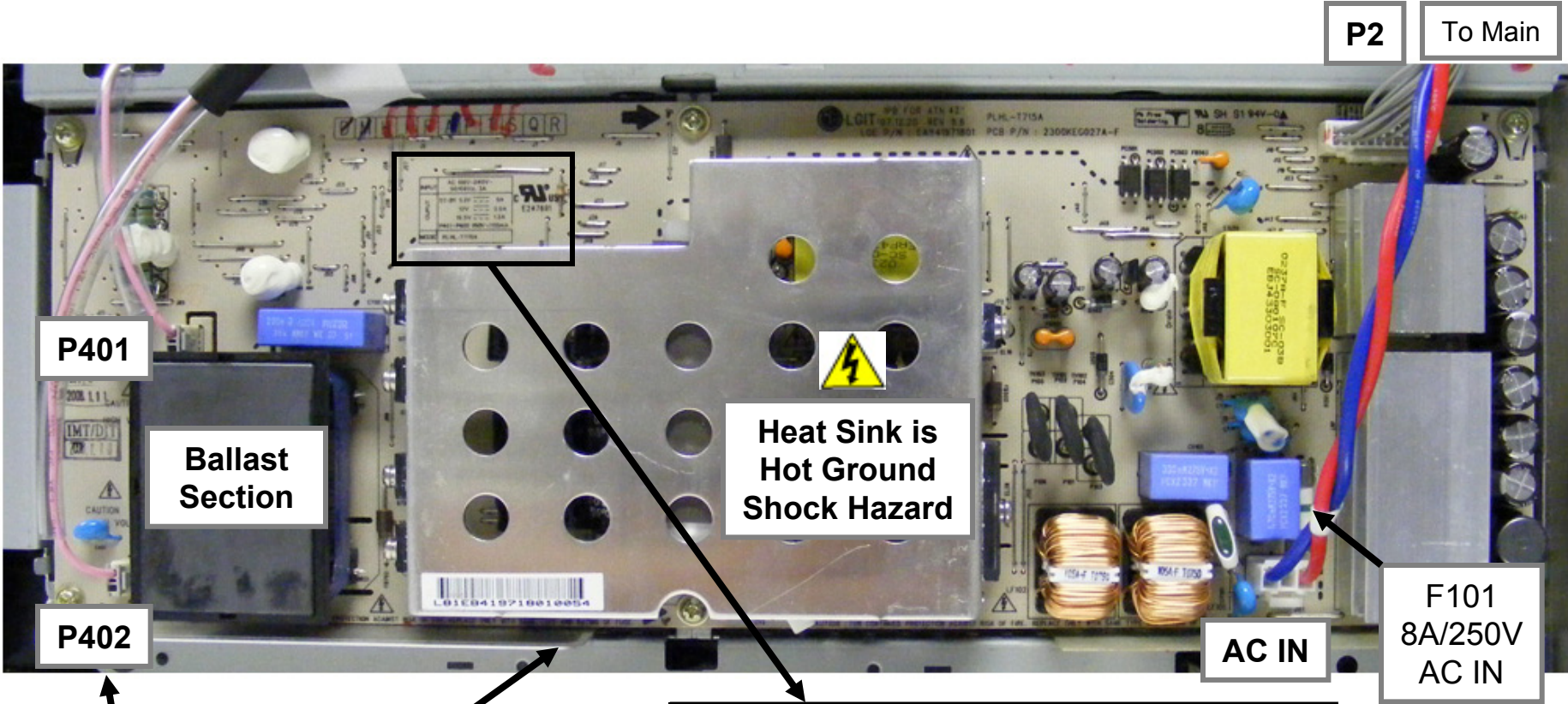


EEFL (External Electrode Fluorescent Lamp)



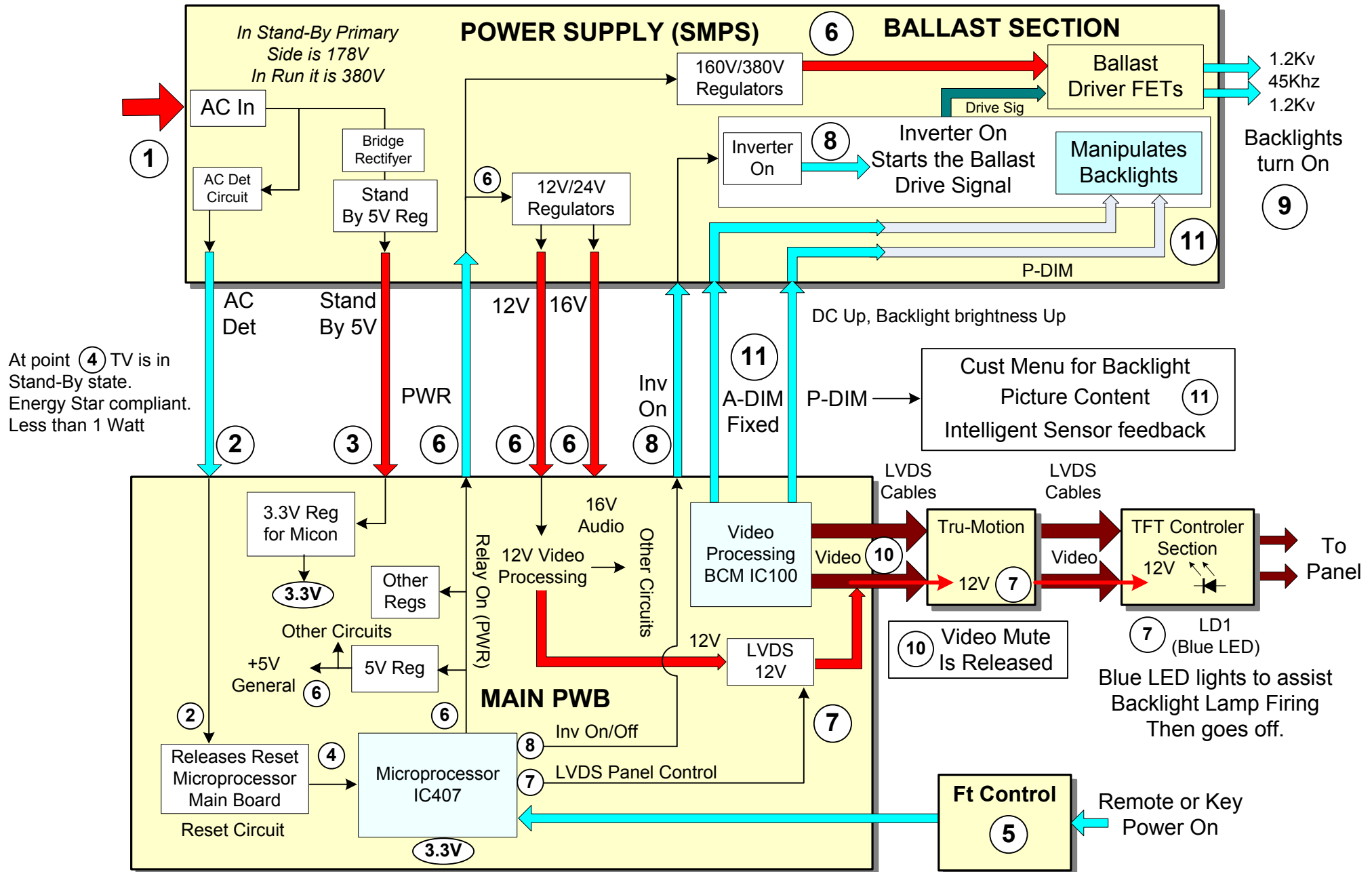
- For CCFL, Hg gas is consumed mainly near the internal electrode
- For EEFL, longer life time is expected because there is no internal electrode consuming Hg gas

POWER SUPPLY (SMPS) PWB SECTION

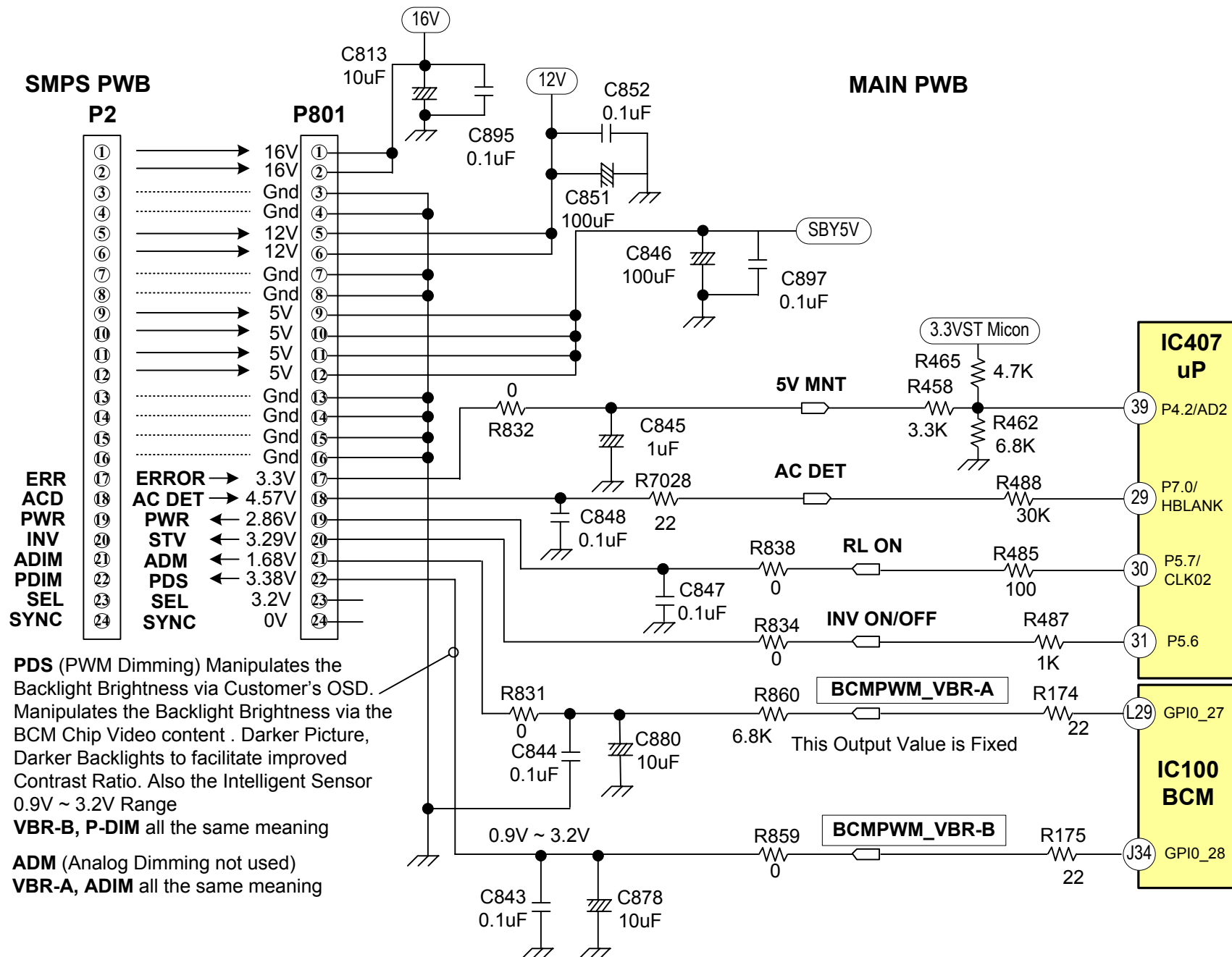


INPUT	AC 100V ~ 240V (50/60Hz) 3A
OUTPUT	St-by 5.2V (5A) 12V (2A) 16.5V (1.3A) P401-P402 950V / 135mA
MODEL	PLHL-T715A

42LG60 POWER SUPPLY TURN ON COMMANDS FROM MAIN PWB

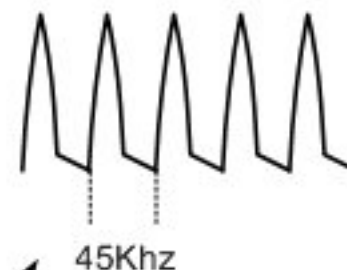


42LG60 P801 ON MAIN PWB TO SMPS



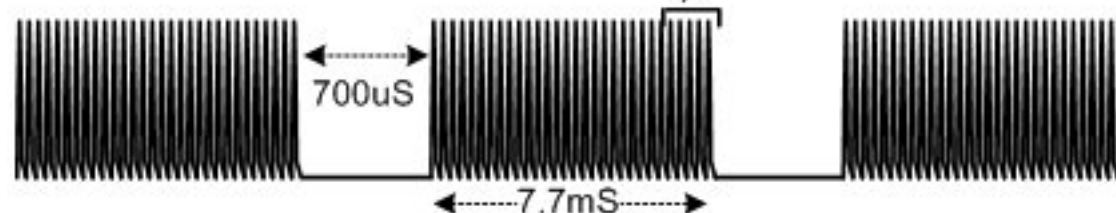
Power Supply Backlight Drive Signal Effects

Waveform taken from either of the two center pins of the Ballast Transformer on the SMPS.
Slow scope setting to 2.5mS to see PWM results.
The PWM amount can cause the frequency to be measured differently.

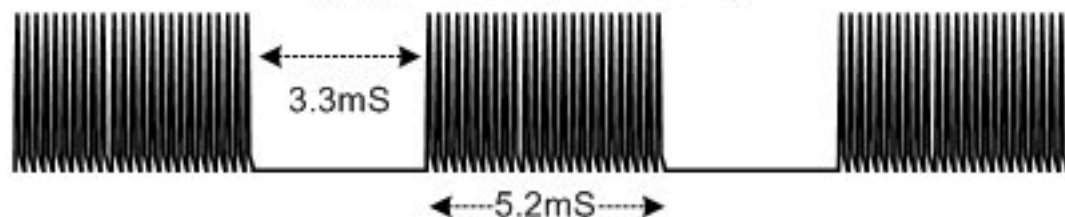


PWMDIM manipulates the Burst Triangle Oscillator in the ballast drive IC.

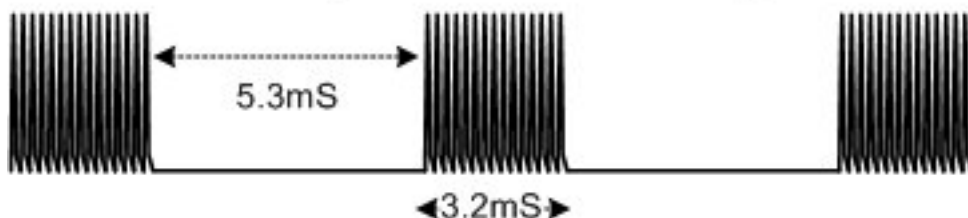
ADIM also manipulates the Burst Triangle Oscillator But it is not used.



80% on Backlight Bar In Customer's OSD
(3.0V PDIM Pin 22 P2)



50% on Backlight Bar In Customer's OSD
(2.0V PDIM Pin 22 P2)



20% on Backlight Bar In Customer's OSD
(1.22V PDIM Pin 22 P2)

Power Supply PWB Test (1ST Test All But Backlights)

P2 Connector disconnected from the Main PWB

AC: Not applied when adding jumpers. Applied when making test.

The Power Supply “**MUST**” be producing STAND-BY +5V and AC Det.

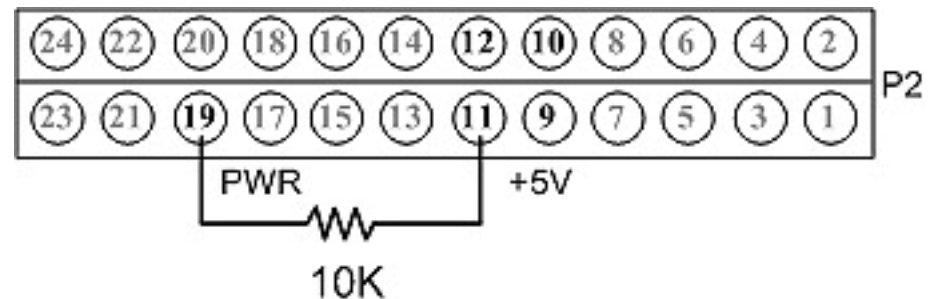
- (1) Short either pin 9, 10, 11 or 12 (5V) to Pin 19 (PWR) using a 10K resistor.
- (2) Apply AC to the PWB.

This turns on the power supply except for the Ballast Section.

Check the following:

Pins 1 and 2 for +16V

Pins 5 and 6 for +12V



Power Supply PWB Test (2nd Test All Including Backlights)

P2 Connector disconnected from the Main PWB. Apply AC after adding jumpers.

If the 1st test was successful, continue. Leave original 10K in place.

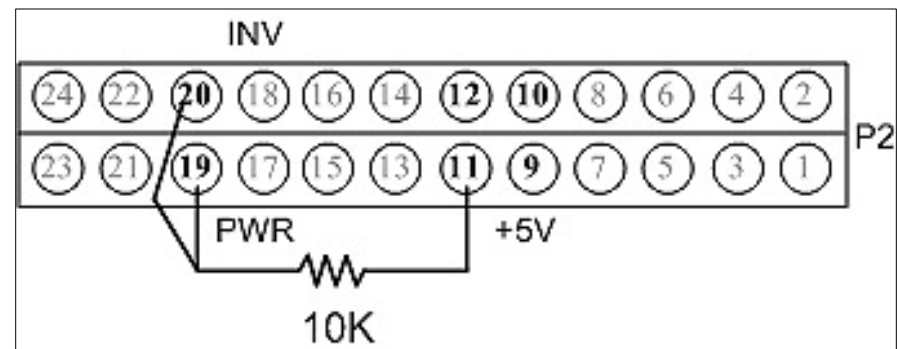
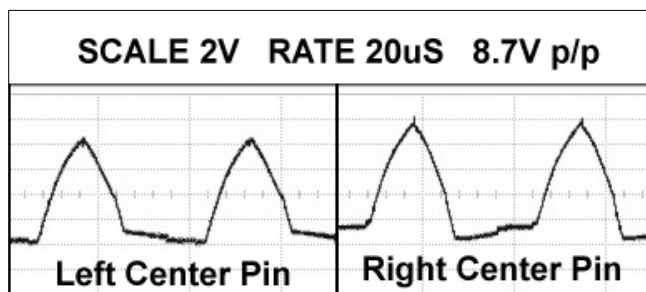
(2): Test the Backlights, jump Pin 19 (PWR) to Pin 20 (INV) and apply AC Power to the PWB. Observe the Backlights. If normal, the backlights should turn on and off 4 times then go off.

If only ½ the backlights light, (Right side or Left Side), confirm connectors are OK. Check Transformer Left and Right center pins for signal. If OK, panel defective, backlight failure. If pulse is missing on one side (L or R Center) of the transformer, power supply defective.

If no backlight activity, confirm the Fuse F700 has approx. 300V on both sides.

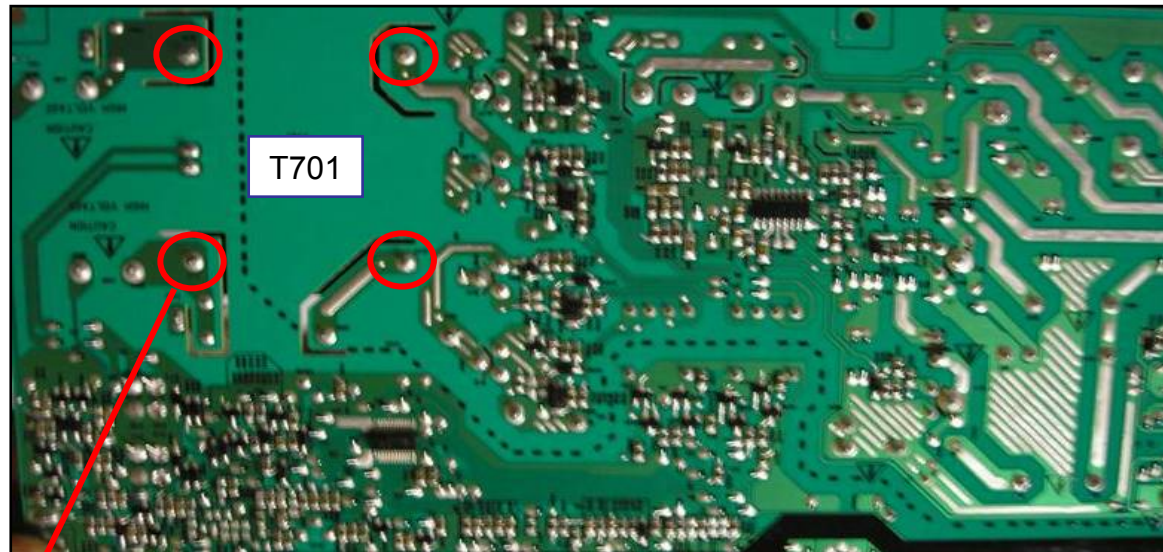
If only on one side, check fuse for open. If no 300V, replace Power Supply.

If 300V DC is present, observe the L and R center legs on the left hand side of ballast transformer T701. Look for 58Khz pulse at 8.7V p/p. If yes, confirm connectors to backlight OK. If OK, then panel is defective. If no pulse is found, replace the Power Supply.



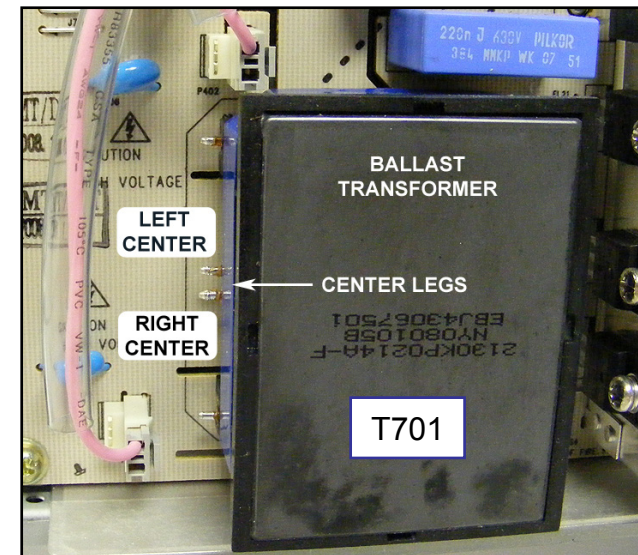
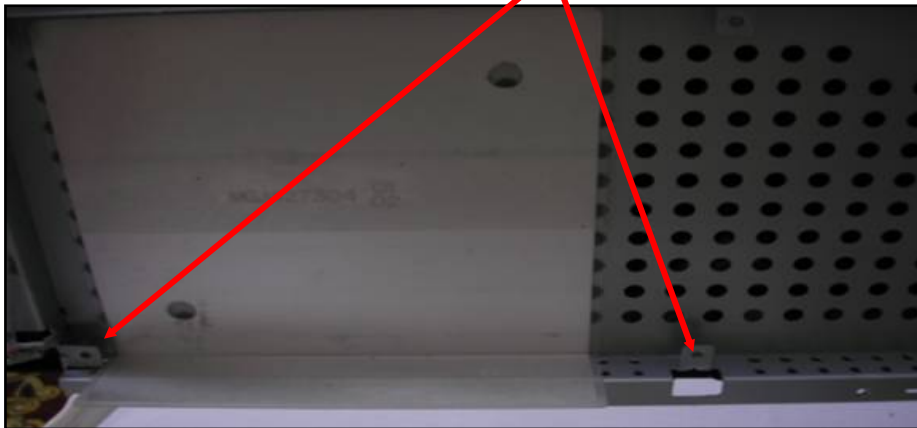
Power Supply Ballast Board Field Issue

Back Side of Power Supply PWB



Long leads from T701 are arcing through the insulator to ground

Mounting Tabs may be bent



Power Supply Connector P2 Odd Pins Voltage and Resistance

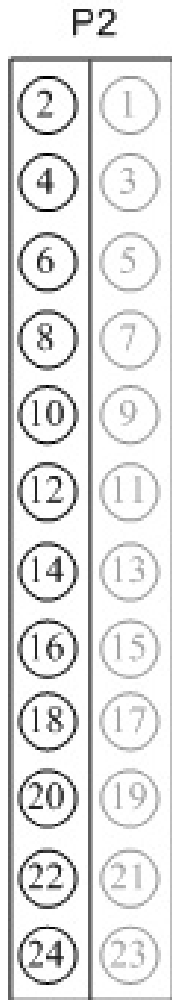
P2		P2 Odd "SMPS" to P801 "Main PWB"				
2	1	Pin	Label	STBY	Run	Diode Check
4	3	1	16V	0V	16V	0.94V
6	5	3	Gnd	Gnd	Gnd	0V
8	7	5	12V	0V	11.8V	1.32V
10	9	7	Gnd	Gnd	Gnd	0V
12	11	9	5V	5V	5.15V	1.49V
14	13	11	5V	5V	5.15V	1.49V
16	15	13	Gnd	Gnd	Gnd	0V
18	17	15	Gnd	Gnd	Gnd	0V
20	19	17	ERR	3.19V	3.3V	OL
22	21	19	PWR	0V	2.86V	OL
24	23	21	ADIM	0.1V	1.68V	OL
		23	SEL	0V	3.2V	OL

Not Used

Not Used

Resistance taken in Diode Mode with Connectors Removed

Power Supply Connector P2 Even Pins Voltage and Resistance



Not Used

P2 Even "SMPS" to P801 "Main PWB"

Pin	Label	STBY	Run	Diode Check
2	16V	0V	16V	0.94V
4	Gnd	Gnd	Gnd	0V
6	12V	0V	11.8V	1.32V
8	Gnd	Gnd	Gnd	0V
10	5V	5.15V	5.15V	1.49V
12	5V	5.15V	5.15V	1.49V
14	Gnd	Gnd	Gnd	0V
16	Gnd	Gnd	Gnd	0V
18	ACD	4V	4.57V	1.85V
20	INV	0V	3.29V	OL
22	PDIM	0V	3.38V	OL
24	SYNC	0V	0V	OL

PDIM Pin 22 can vary according to OSD Backlight setting. 0.9V 0% to 3.3V 100%

Resistance taken in Diode Mode with Connectors Removed

SMPS PWB Connector P401 or P402 Voltage and Resistance

P401 or P402 Backlights

Pin	STBY	Run	Diode Check
1	0V	>1Kvac	0V
2	0V	>1Kvac	0V

Caution: AC over 1Kv. Use extreme caution when reading this voltage.
Operating Frequency 54Khz.

Pins 1 and 2 are actually shorted together. (Either Plug)
Reading between P401 and P402 actually reads the Transformer T701 windings. (0.1V)

For a simple and safe test:

Place the Oscilloscope Probe along side the wire from P401 and P402 connectors to the Ballast and a 17.5 μ sec sine waveform should be measured this would be an indication that the ballast supply is functioning.

Resistance taken in Diode Mode with Connectors Removed

TRUMOTION PWB SECTION

The Control PWB contains the **MICRONAS** chip IC101.

This IC is a Full-HD Rate Converter with Motion Blur Removal and Film De-Juddering for 1080p 100/120 Hz LCD panels.

- **Vector Based Motion Compensation with Frame Rate Conversion**

(eliminates the need for 3:2 Pull Down)

- **Dual 10 bit LVDS input**

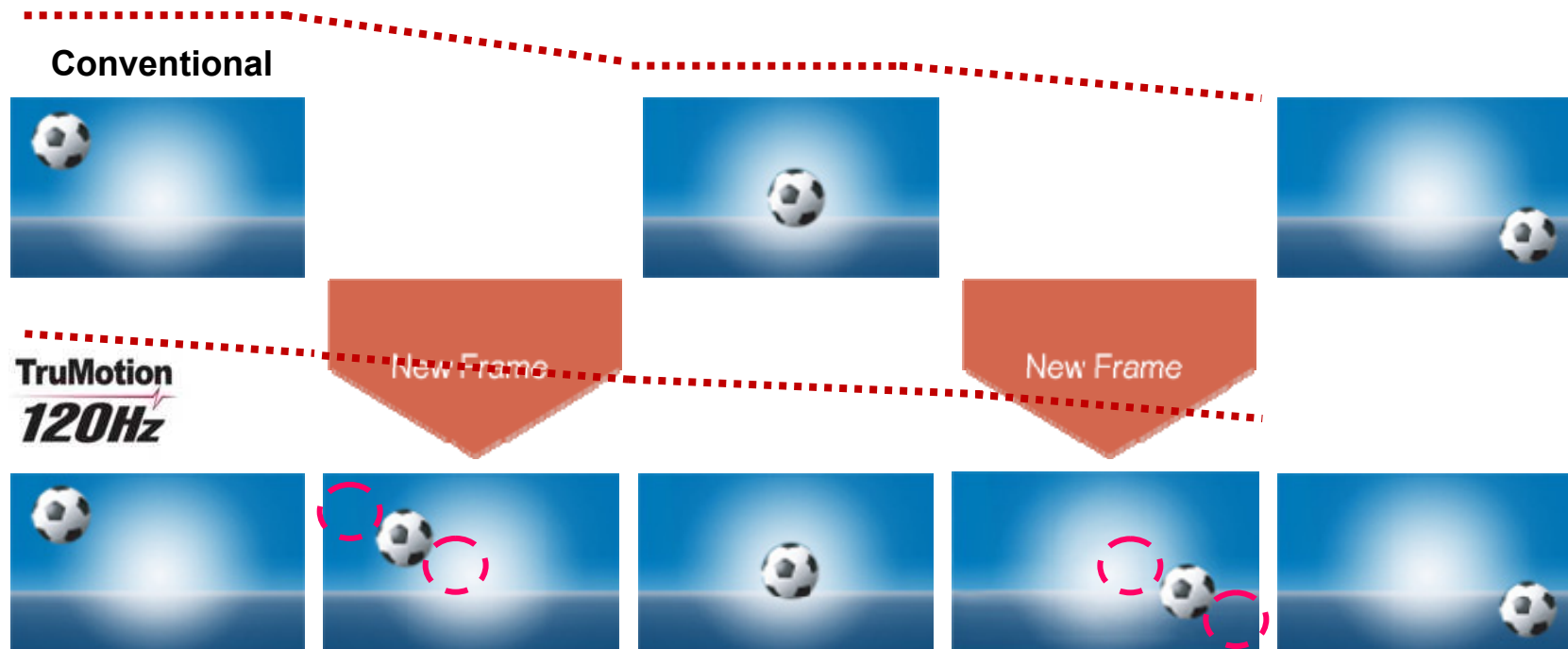
- **Quadruple 12 bit LVDS output**

Motion Blur Removal increases the video frames by Interpolating a new image frame between each original frame (Motion Estimated Data Insertion) **MEDI**.

Juddering is a phenomenon which appears on film based programming due to the 24 frames per second system used for recording, the picture develops visual artifacts when converted to 60 frames per second. 3:2 Pull Down was developed to eliminate this problem. Frame Rate Conversion (Real Cinema) eliminates the need for 3:2 Pull Down.

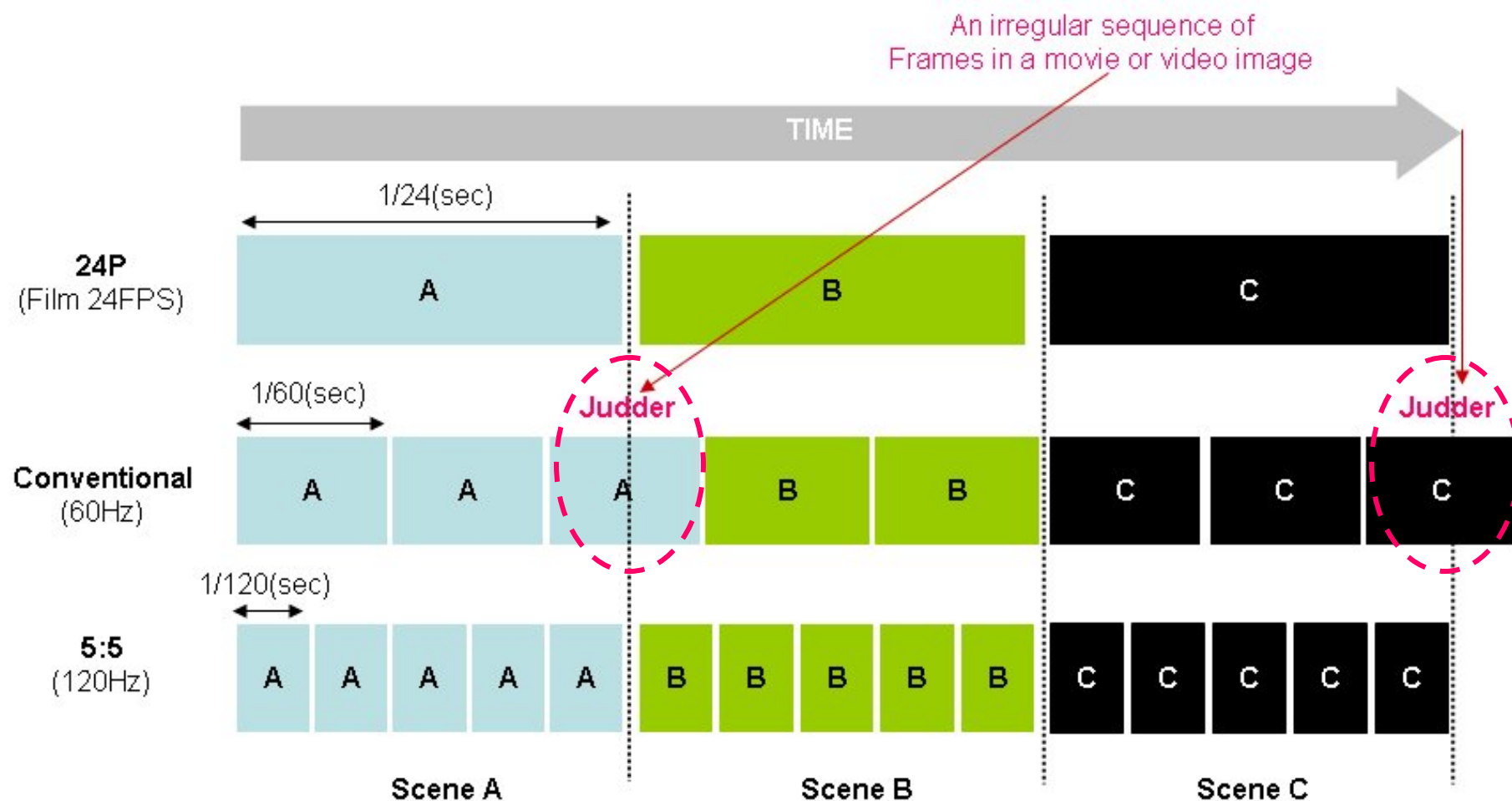
TruMotion 120Hz (Vector Based Motion Compensation)

TruMotion 120 Hz can reduce blurring on fast moving scenes. TruMotion carefully analyses the picture signal by using advanced algorithms to automatically calculate a new image frame between each original frame (MEDI).

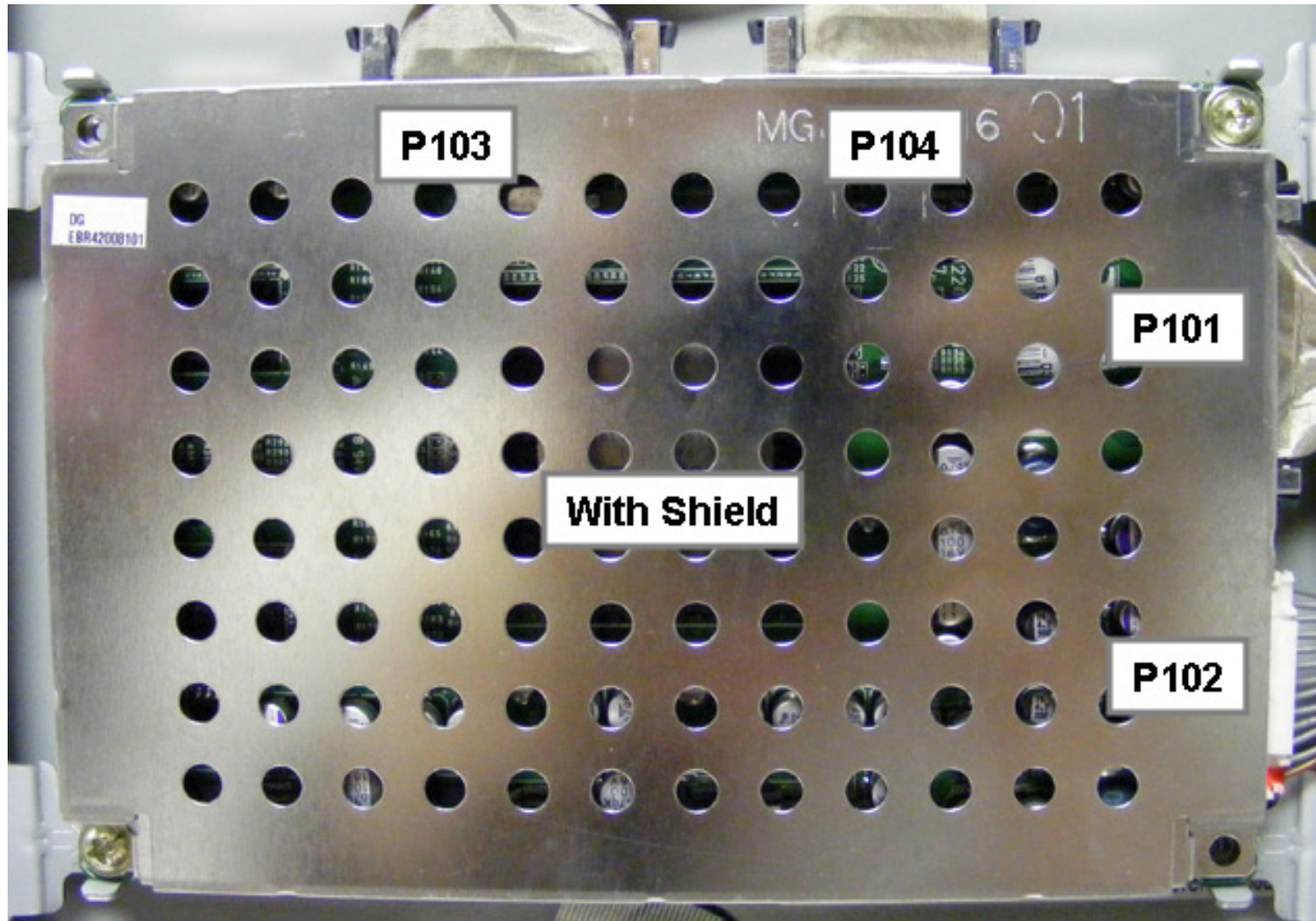


24P Real Cinema

Frame Rate Conversion eliminates the need for 3:2 Pull Down Conversion



TruMotion PWB (With Shield)

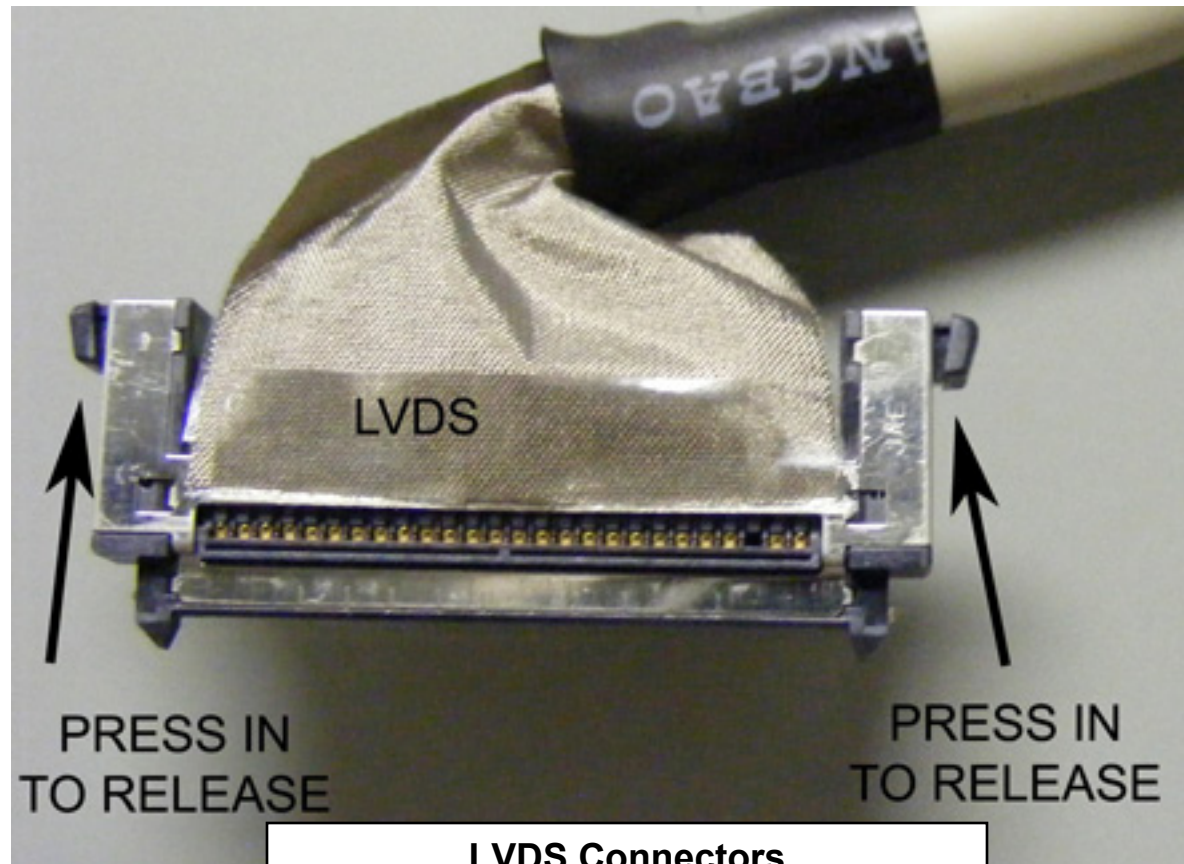


TruMotion PWB Removing the LVDS Cable

Disconnect P101, P103 and P104 LVDS Cables

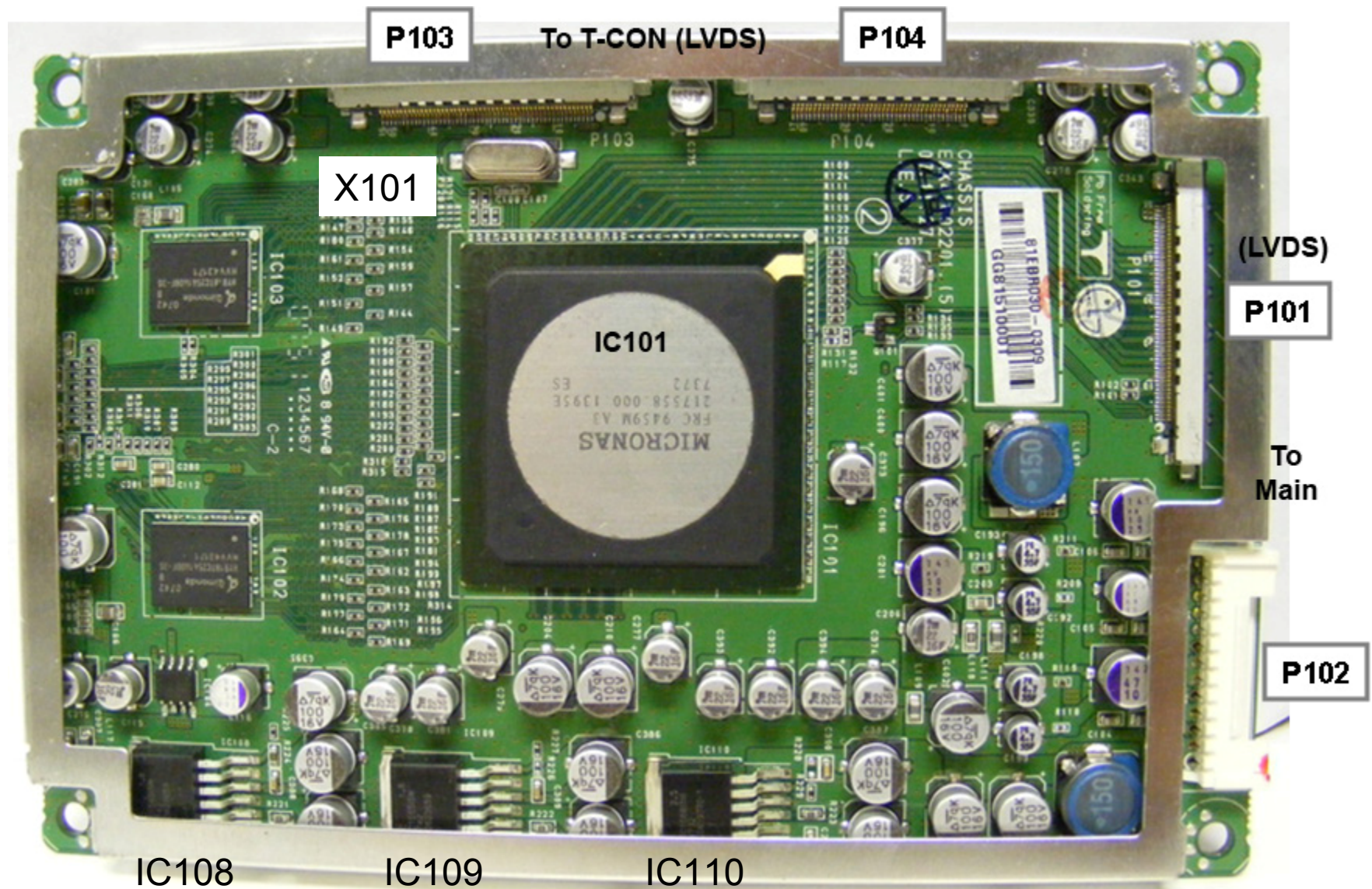
CAUTION: When removing LVDS Cables, be careful.

Press the release Tabs to avoid damage to PWB or to the Cable itself.

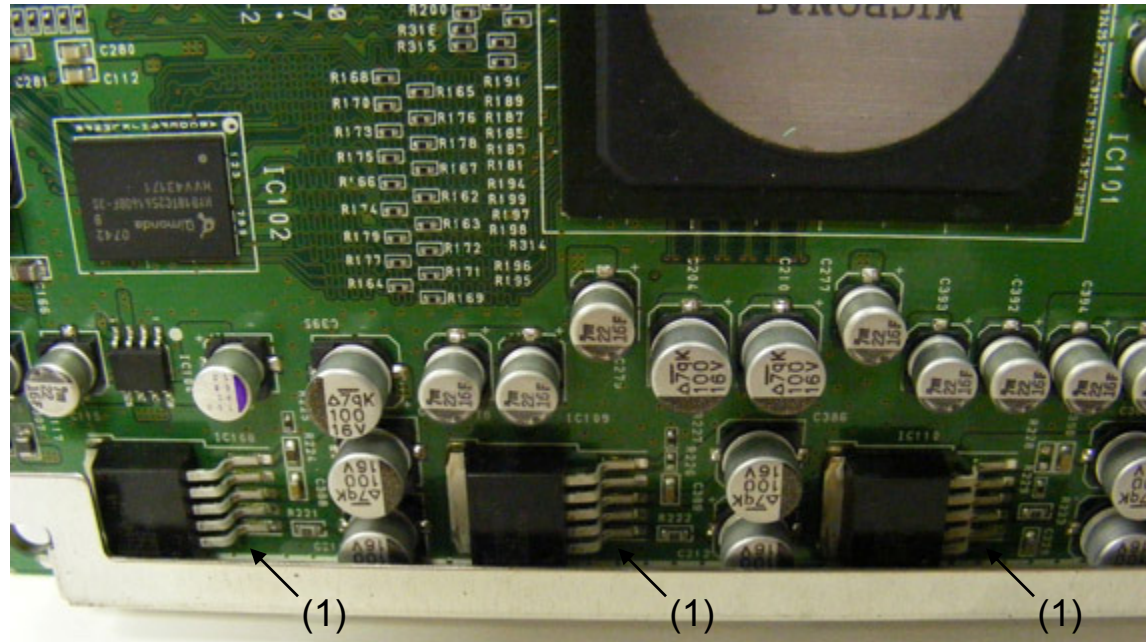


LVDS Connectors
Press in from the sides and lift out.

TruMotion PWB (Layout with Shield Removed)



TruMotion PWB Regulators Identified and Voltages



IC108

5 (1.2V)
4 (1.3V)
3 (0V)
2 (3.37V)
1 (3.29V)

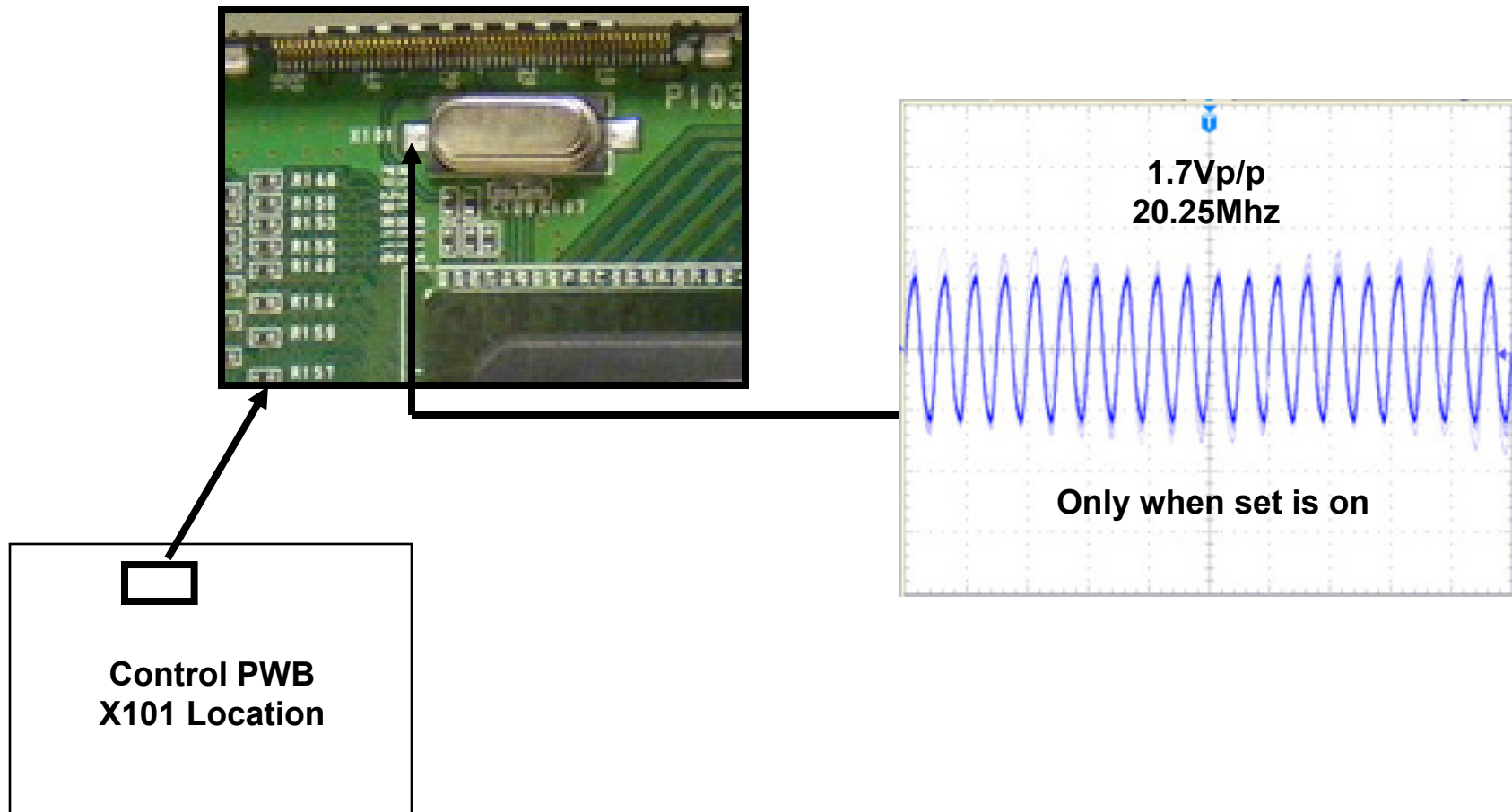
IC109

5 (0V)
4 (1.79V)
3 (0V)
2 (3.36V)
1 (3.29V)

IC110

5 (2.5V)
4 (0V)
3 (0V)
2 (3.3V)
1 (3.37V)

TruMotion PWB Crystal X101 Check

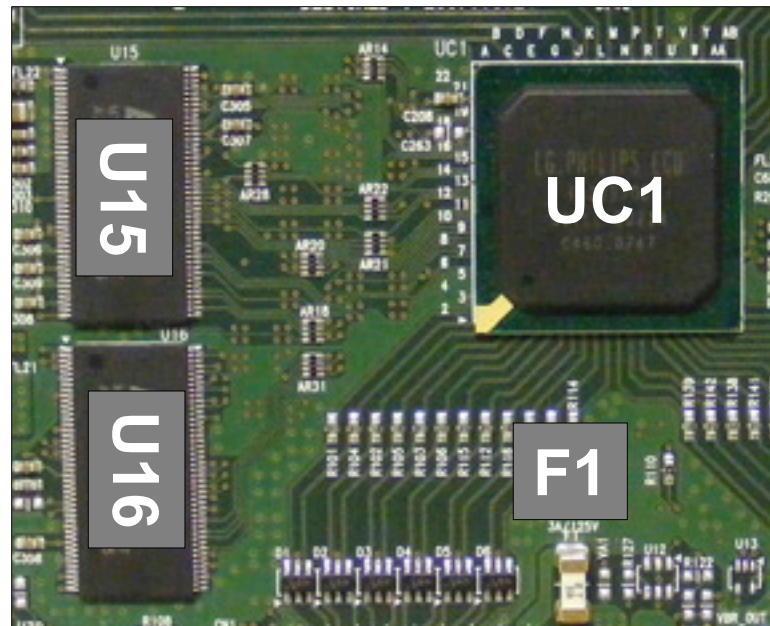


T-CON (TFT DRIVE) PWB SECTION

LCD Controller Board

The T Con IC UC1 receives from the Control Board at CN1 and CN2 Quadruple 12 Bit LVDS Signals which it processes into TFT Drive Signals which through connectors CN4 and CN5 control the LCD Panel. IC's U15 and U16 are "Dynamic Ram IC's which are High Speed Storage Devices used to store the data until it is time to be addressed. 12V is supplied to the T Con Board on connector CN1 from the Control Board (easily measured at fuse F1). Diode LD1 is a boot up indicator and is helpful in troubleshooting as a quick indication of a loss of supply and or a Boot Up problem.

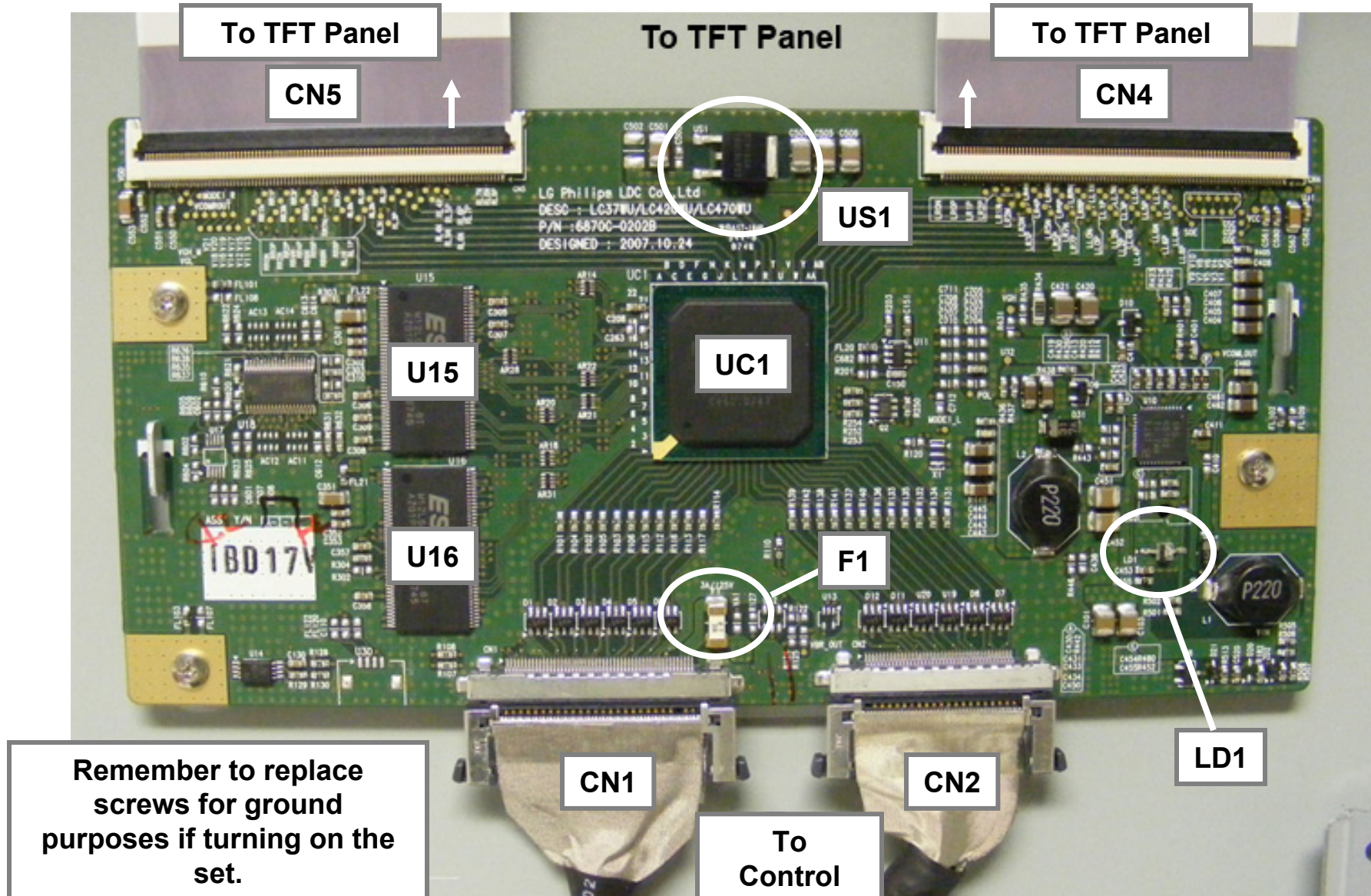
LG Philips LCD Drive IC



T CON IC TL22970D

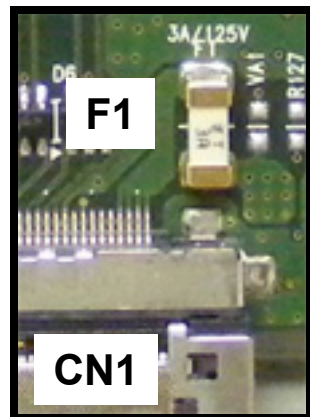
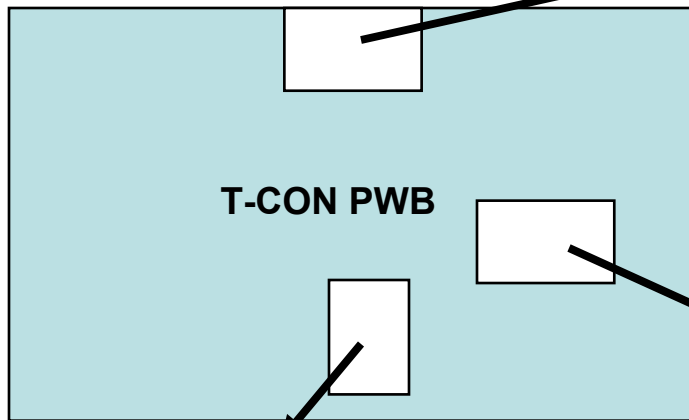
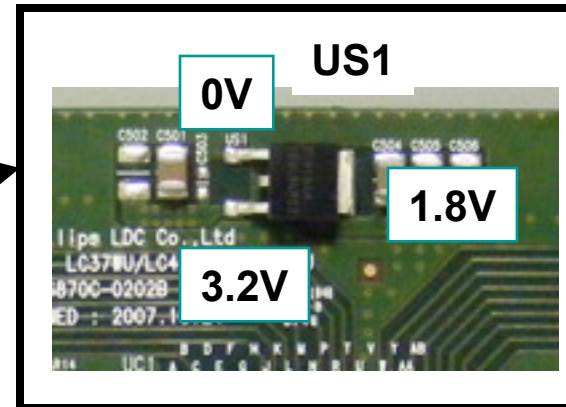
*Next Slide
gives greater
layout details*

T-CON (TFT Drive) PWB (Shield Removed) p/n EAT56803901

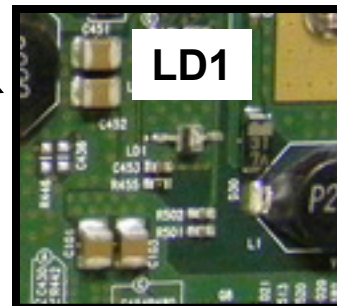


T-CON (TFT DRIVE) PWB CHECKS

Check the Regulator
US1 for Correct Voltage



Check Fuse
F1 for 12V



Use LD1 to determine if
The boot up sequence of
The T-CON is OK.
This LED will turn bright Blue
Shortly after power is applied
then go out shortly after
backlights illuminate if all is OK.

Power Off
Anode 0V
Cathode 0V
LED OFF

Power 1st On
Anode 11.6V
Cathode 0V
LED ON

Power On
Anode 11.6V
Cathode 9.5V
LED OFF

MAIN PWB SECTION

Input Signal Processing

The Broadcom or BCM IC100 is the main signal processing IC. and is responsible for :

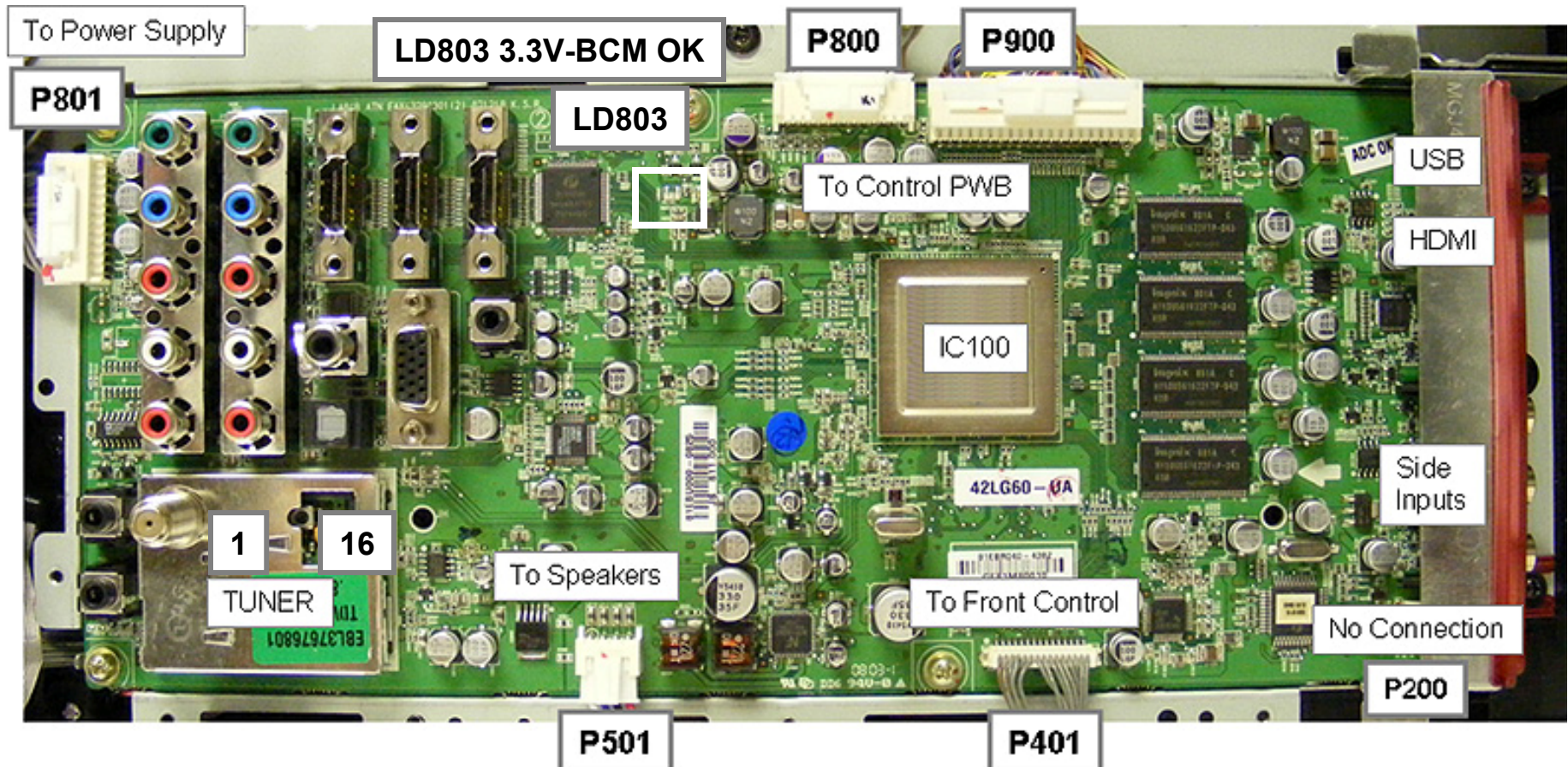
- ATSC, NTSC, and QAM
- RS 232 service only Port
- Wired Remote Port
- (2) Component Inputs Y, Pr, Pb and Audio L R
- (3) HDMI Inputs (back) (1) HDMI (Side Input)
- RGB PC
- USB (Side Input)
- AV Composite
- SIF and SAP

Output Signals

- Dual 10 Bit LVDS to the Control Board
- Audio output signals to the Speakers
- Digital Audio Output Coaxial and Optical
- ON OFF Control

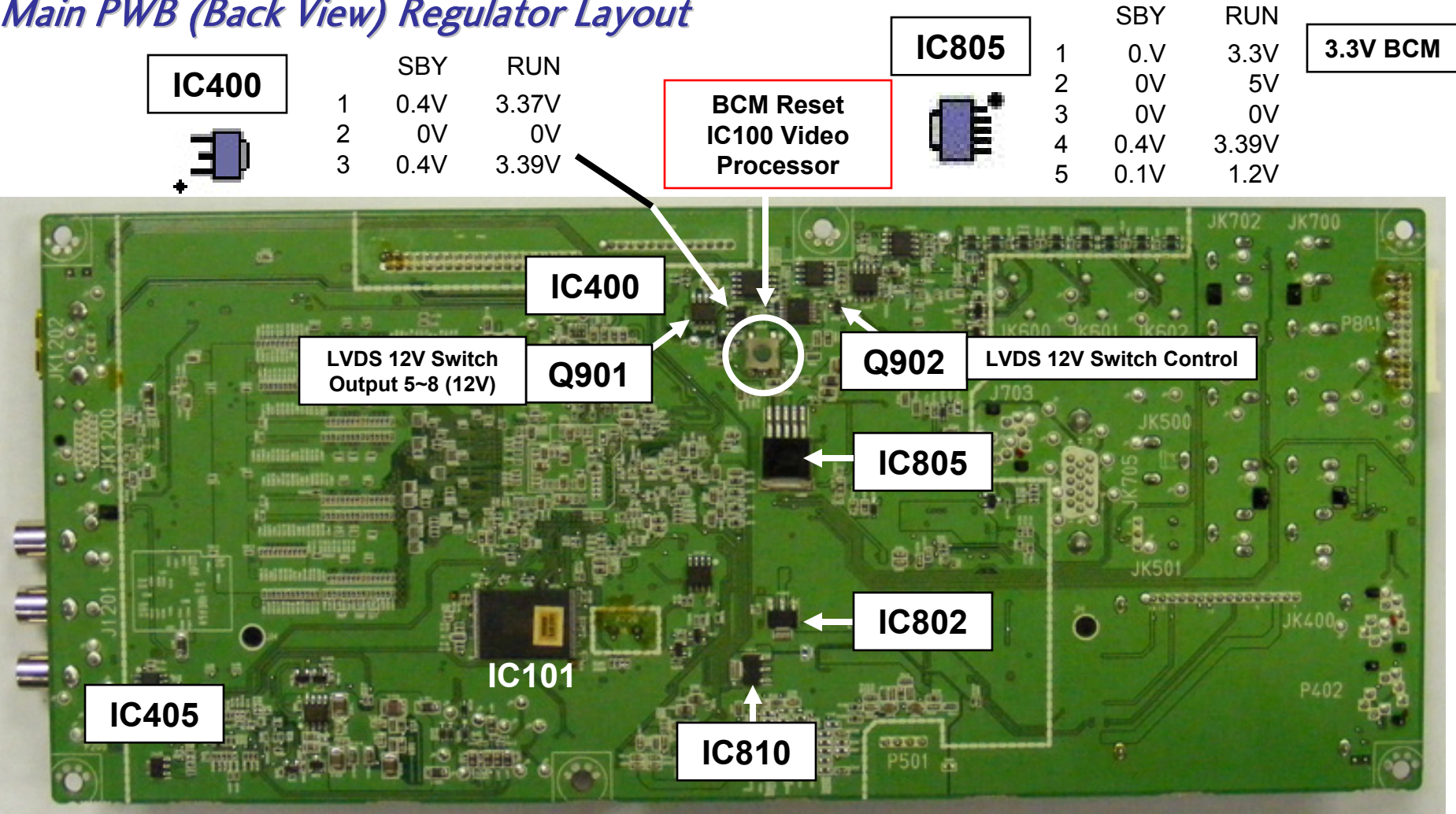
42LG60

VIDEO PROCESSOR IC100 RUNS HOT, THIS IS NORMAL.

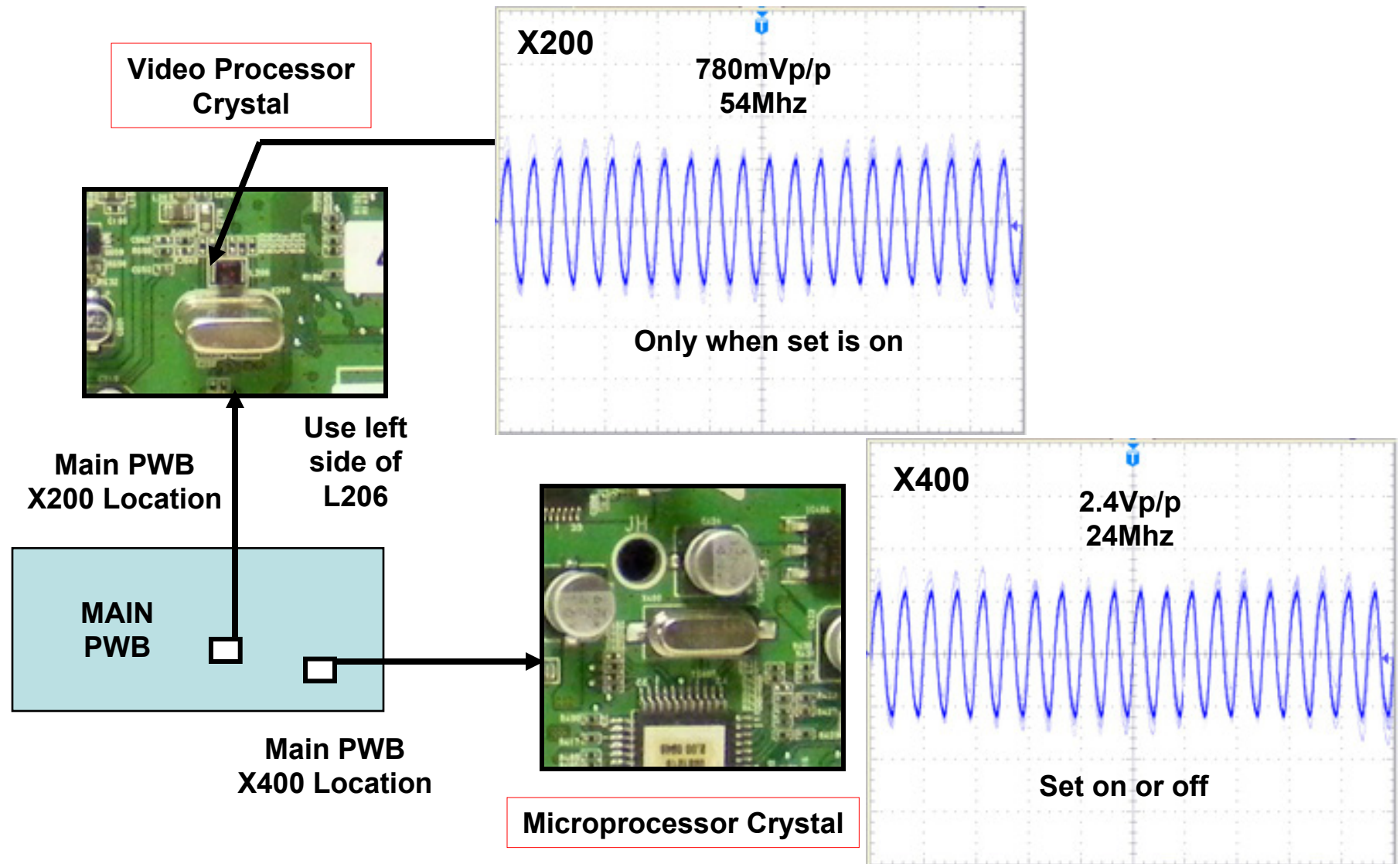


If odd Video problems are found, use some freeze spray about IC100 and its circuits,
If video returns to normal, PWB needs to be replaced.

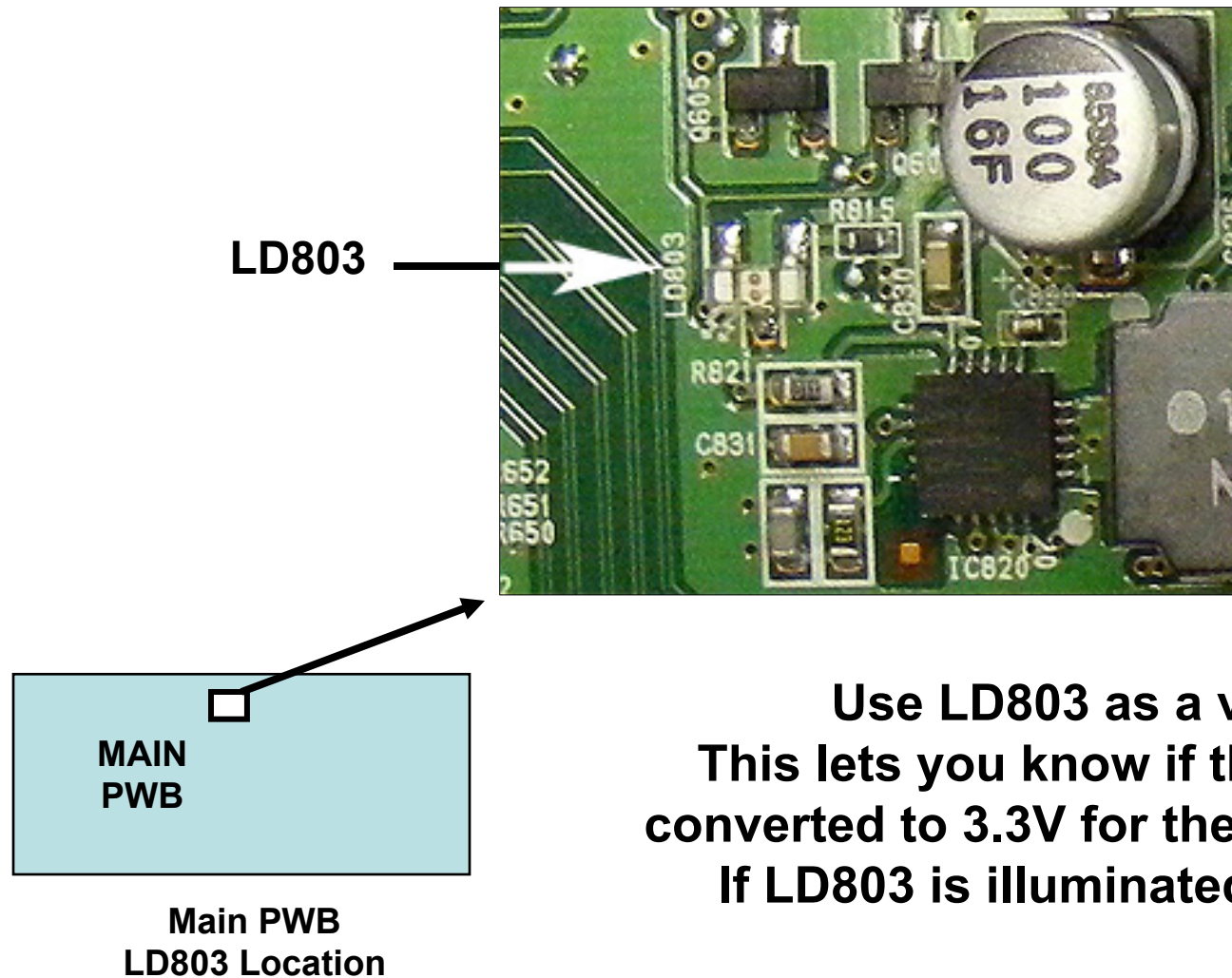
Main PWB (Back View) Regulator Layout



Main PWB X400 and X200 Check



Main PWB LD803 Check

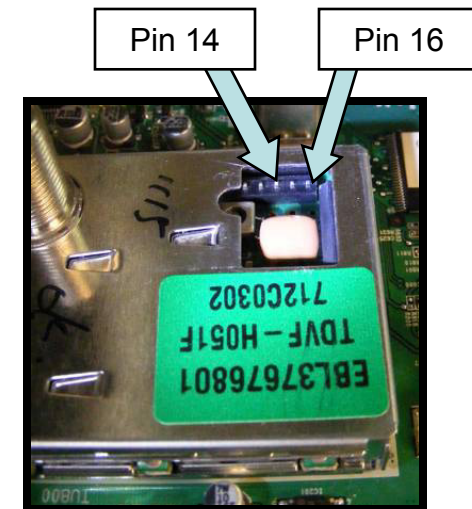
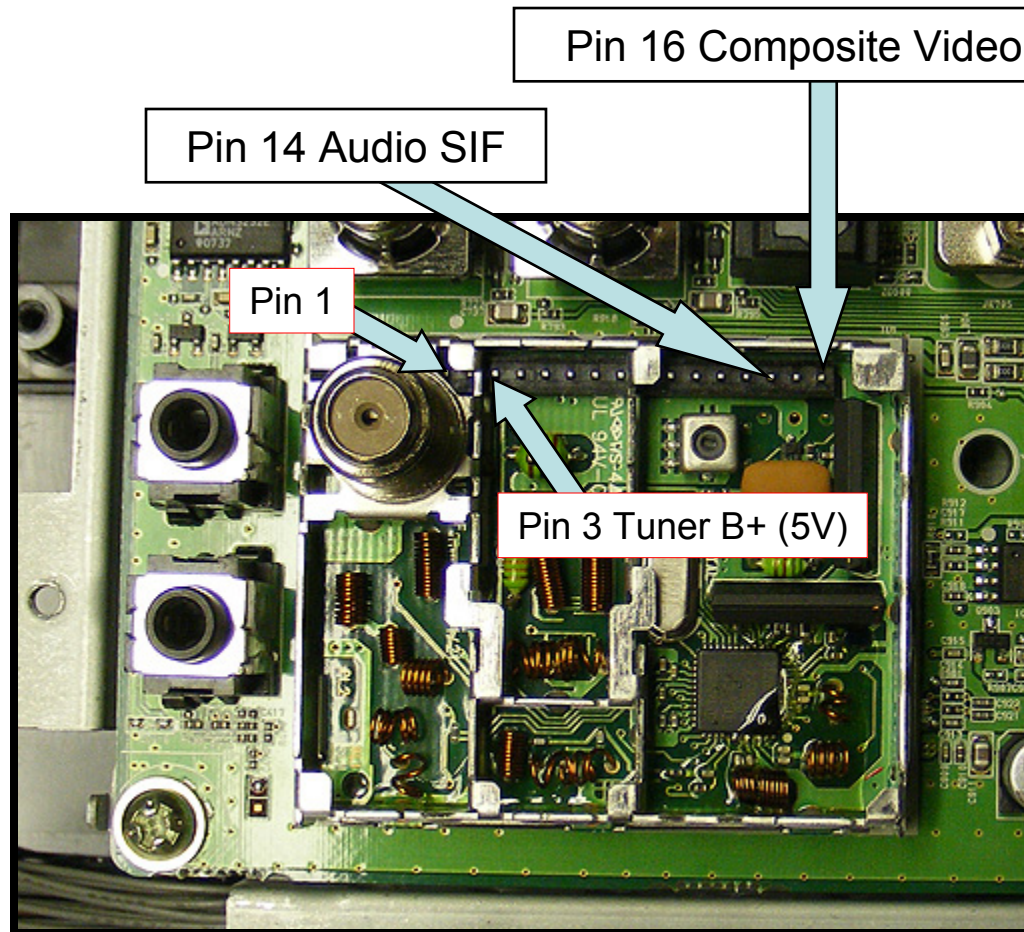


**Use LD803 as a visual aid.
This lets you know if the +5V is being
converted to 3.3V for the BCM chip IC100.
If LD803 is illuminated, +3.3V is OK.**

Note: Only ½ of the dual LED is used.

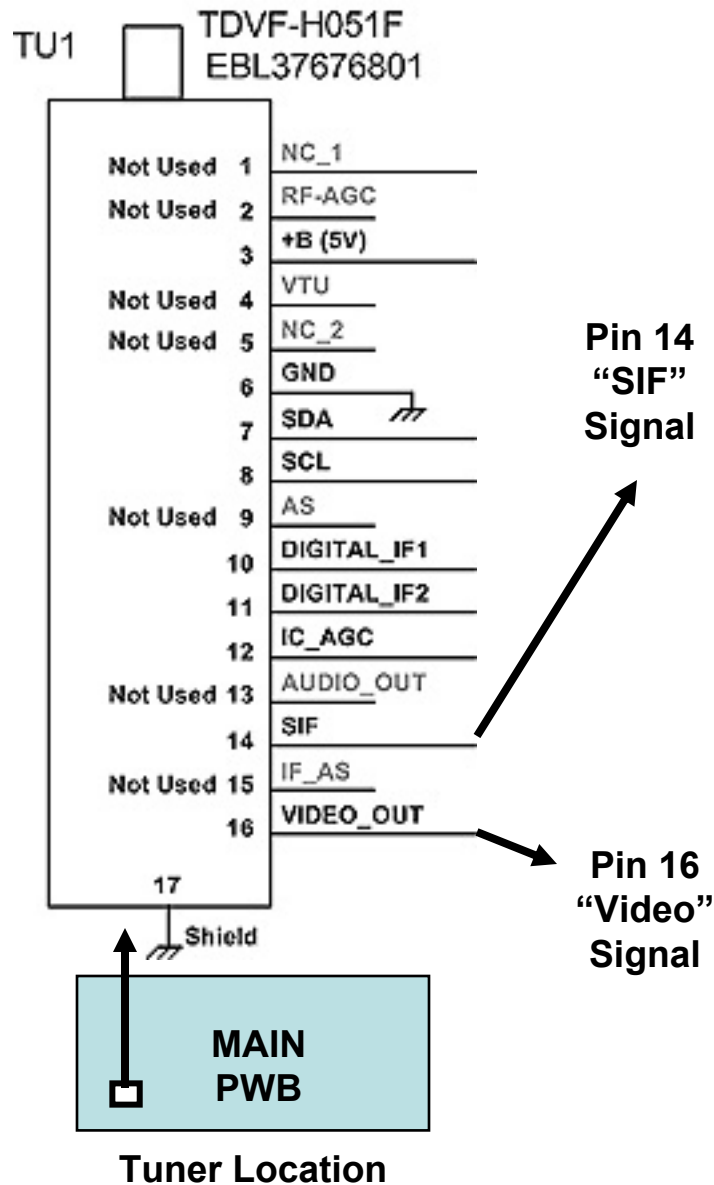
Main PWB Tuner Video and SIF Output Check Pin Location

For Easy Access, pop the shield off the tuner

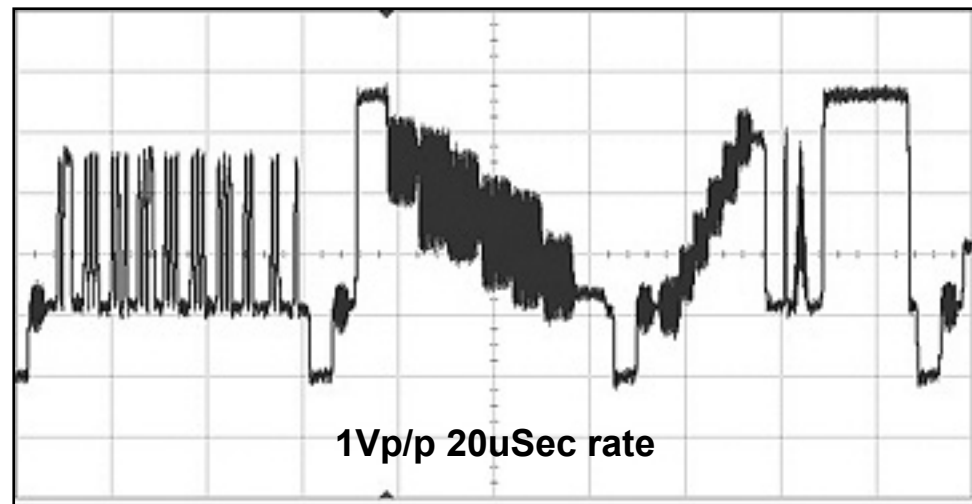
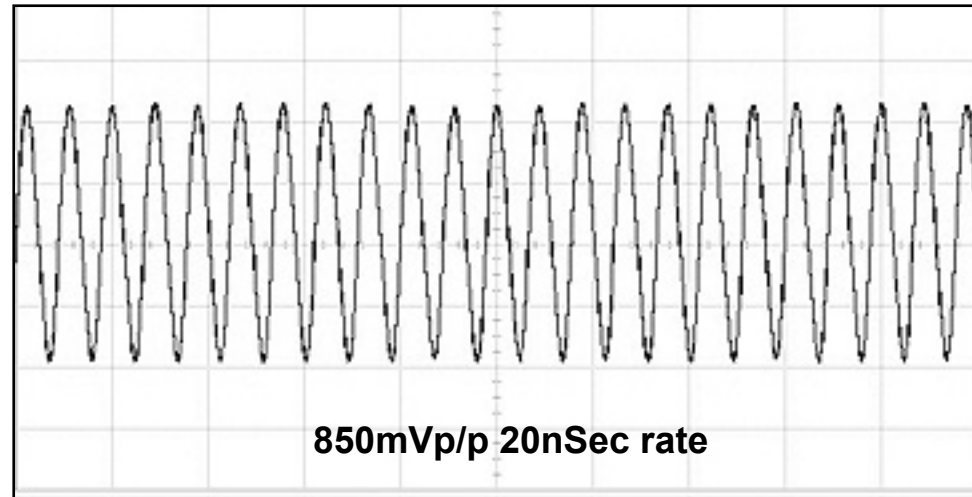


If you leave the shield on you can still access the same pins. Be careful not to accidentally ground out your test lead on the shield.
(Note: This is a picture from a different model, but the concept is the same)

Main PWB Tuner Video and SIF Output Check

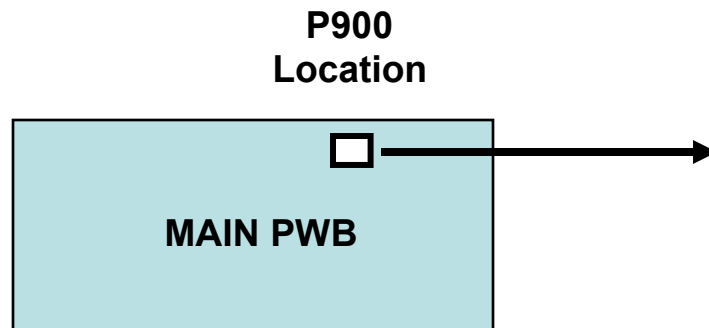


USING SMTE COLOR BAR SIGNAL INPUT

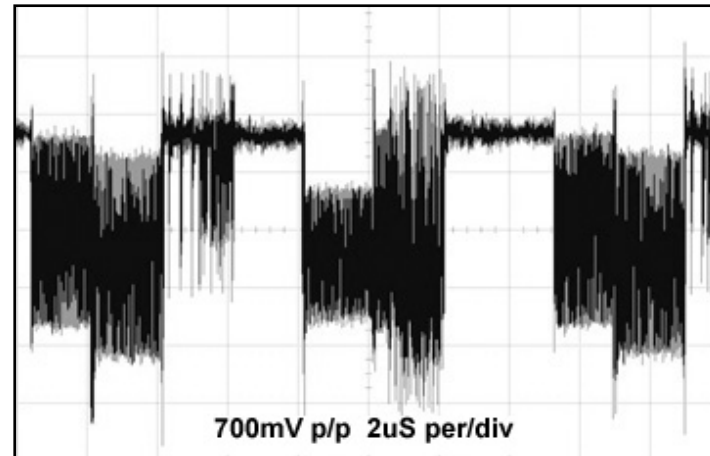


Main PWB LVDS P900 Output Check

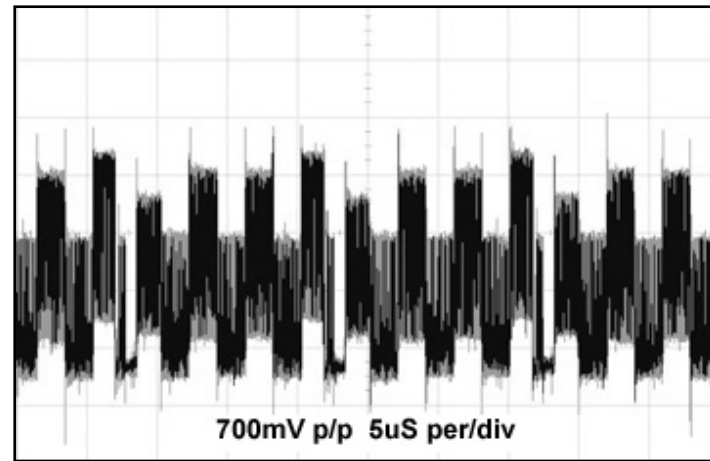
To confirm that the Main PWB is outputting Picture Content signals, check P900 (LVDS) cable for output. Check 11-22 and 27-38. This signals vary from each other, but looking for signals like the ones shown below on any of these pins will confirm the output of video content. This signal is using standard SMTE Color Bar output from a generator as the input source.



Pin 11

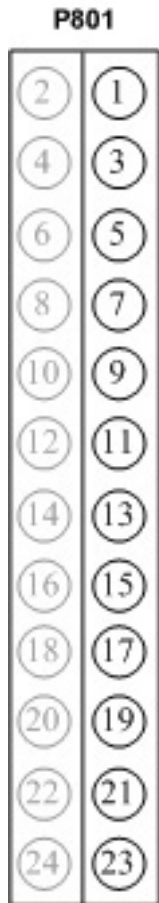


Pin 16



This is just a sample
of two pins on the LVDS.
There are 24 pins carrying video.

Main PWB Connector P801 Odd Pins Voltage and Resistance



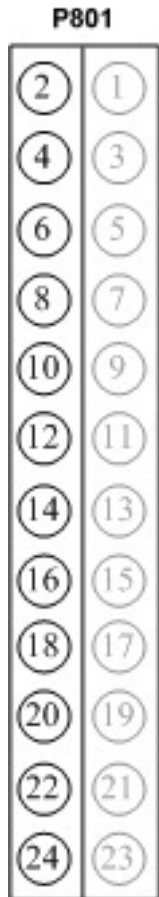
P801 CONNECTOR "Main" Odd Pins to P2 "SMPS PWB"

Pin	Label	STBY	Run	Diode Check
1	16V	0V	16V	OL
3	Gnd	Gnd	Gnd	Gnd
5	12V	0V	11.8V	3V
7	Gnd	Gnd	Gnd	Gnd
9	5V	5V	5.15V	1.47V
11	5V	5V	5.15V	1.47V
13	Gnd	Gnd	Gnd	Gnd
15	Gnd	Gnd	Gnd	Gnd
17	ERR	3.19V	3.3V	2.89V
19	PWR	0V	2.86V	1.1V
21	ADM	0.1V	1.68V	OL
23	SEL	0V	3.2V	OL

Pin 17 ERR is not used.
 Pin 21 ADIM is a fixed voltage.
 Pin 23 SEL is not used.

Resistance taken in Diode Mode with Connectors Removed

Main PWB Connector P801 Even Pins Voltage and Resistance



P801 CONNECTOR "Main" Even Pins to P2 "SMPS PWB"

Pin	Label	STBY	Run	Diode Check
2	16V	0V	16V	OL
4	Gnd	Gnd	Gnd	Gnd
6	12V	0V	11.8V	3V
8	Gnd	Gnd	Gnd	Gnd
10	5V	5.15V	5.15V	1.47V
12	5V	5.15V	5.15V	1.47V
14	Gnd	Gnd	Gnd	Gnd
16	Gnd	Gnd	Gnd	Gnd
18	AC Det	4V	4.57V	OL
20	STV	0V	3.29V	1.8V
22	PDS	0V	3.38V	OL
24	SYNC	0V	0V	OL

Pin 22 PDIM can vary according to OSD Backlight setting. 0.9V 0% to 3.3V 100%
Pin 24 is not used

Resistance taken in Diode Mode with Connectors Removed

Main PWB Connector P401 Voltage and Resistance

P401 CONNECTOR "MAIN PWB" to "Front PWB Assy"

Pin	LABEL	STBY	Run	Diode Check
1	EYEQ-SCL	3.25V	3.25V	2.26V
2	EYEQ-SDA	3.25V	3.25V	2.26V
3	Gnd	0V	0V	Gnd
4	Gnd	0V	0V	Gnd
5	Key1	3.3V	3.3V	1.85V
6	Key2	3.3V	3.3V	1.85V
7	3.3V	3.3V	3.3V	0.71V
8	5V	5V	5V	1.47V
9	EYEQ-Reset	0V	0V	Gnd
10	IR	3.92V	3.92V	1.35V
11	SPKN	0V	0V	OL
12	Gnd	0V	0V	Gnd
13	SPKP	0V	0V	OL
14	n/c	0V	0V	OL
15	Gnd	0V	0V	Gnd

Resistance taken in Diode Mode with Connectors Removed

Main PWB Connector P800 and P501 Voltage and Resistance

P800 CONNECTOR "Main" Odd Pins to P102 "Control PWB"

Pin	SBY	Run	Diode Check
1	0V	5V	0.8V
2	0V	5V	0.8V
3	0V	0V	Gnd
4	0.5V	3.3V	0.55V
5	0V	0V	Gnd
6	0V	16V	OL
7	0V	16V	OL
8	0V	0V	Gnd
9	3.3V	3.3V	1.39V
10	3.3V	3.3V	1.28V
11	3.3V	3.3V	1.24V
12	3.3V	3.3V	1.29V
13	3.3V	0V	1.35V

P501 CONNECTOR "Main" to "Speakers"

Pin	SBY	Run	Diode Check
1	0V	8V	2.58V
2	0V	8V	2.58V
3	0V	8V	2.58V
4	0V	8V	2.58V

**Use speaker out to test for
defective Audio Amp
IC501**

Resistance taken in Diode Mode with Connectors Removed


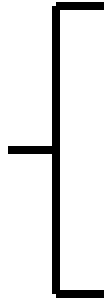
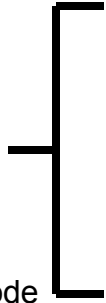
Main PWB Connector P900 "Odd Pins" Voltage and Resistance

	Pin	SBY	Run	Diode Check
Switched LVDS 12V	1	0V	11.7V	OL
	3	0V	11.7V	OL
	5	0V	0V	Gnd
	7	0V	0V	Gnd
SCL	9	0.47V	3.3V	1V
Video Signal Pins	11	0V	1.14V	1V
	13	0V	1.11V	1V
	15	0V	1.12V	1V
	17	0V	1.11V	1V
	19	0V	1.16V	1V
	21	0V	1.14V	1V
n/c	23	0V	0V	OL
	25	0.5V	3.15V	2.98V
Video Signal Pins	27	0V	1.14V	1V
	29	0V	1.12V	1V
	31	0V	1.14V	1V
	33	0V	1.07V	1V
	35	0V	1.16V	1V
	37	0V	1.16V	1V
n/c	39	0V	0V	OL

P900 CONNECTOR
"Main" Odd Pins to P104
"Control PWB"

Resistance taken in Diode
 Mode with Connectors
 Removed

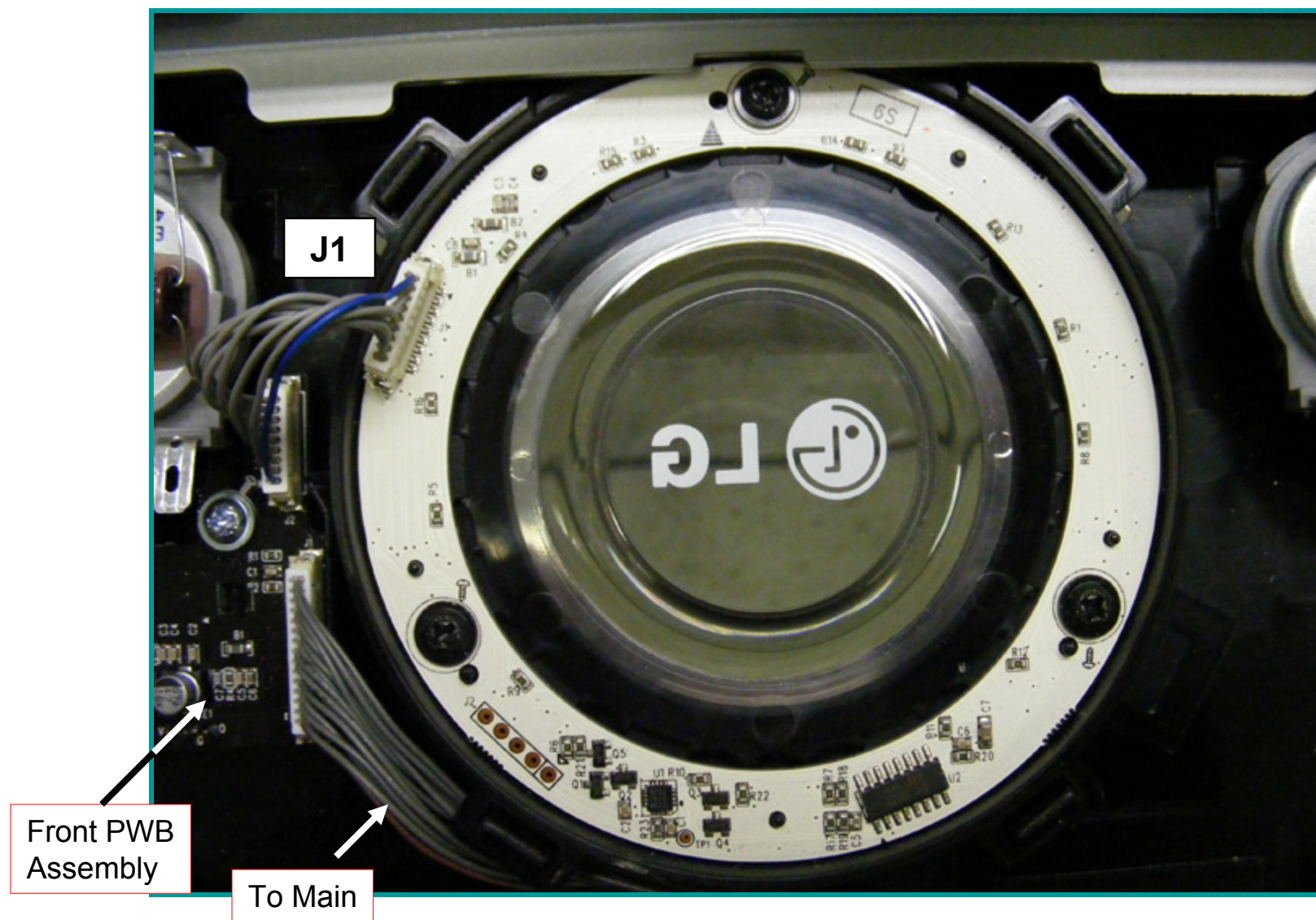
Main PWB Connector P900 "Even Pins" Voltage and Resistance

		Pin	SBY	Run	Diode Check	
Switched LVDS 12V		2	0V	11.7V	OL	
		4	0V	11.7V	OL	
		6	0V	0V	Gnd	
		8	0V	0V	Gnd	
Video Signal Pins		SDA	10	0V	3.3V	1V
		12	0V	1.14V	1V	
		14	0V	1.11V	1V	
		16	0V	1.05V	1V	
		18	0V	1.11V	1V	
		20	0V	1.07V	1V	
		22	0V	1.05V	1V	
		FRC Reset	24	0V	3.25V	1.28v
Video Signal Pins		26	0V	3.3V	3V	
		28	0V	1.14V	1V	
		30	0V	1.09V	1V	
		32	0V	1.07V	1V	
		34	0V	1.13V	1V	
		36	0V	1.07V	1V	
		38	0V	1.07V	1V	
Resistance taken in Diode Mode with Connectors Removed		40	0V	0V	Gnd	

P900 CONNECTOR
"Main" Even Pins to P104
"Control PWB"

Resistance taken in
 Diode Mode with
 Connectors Removed

FRONT TOUCH AND LED PWB SECTION



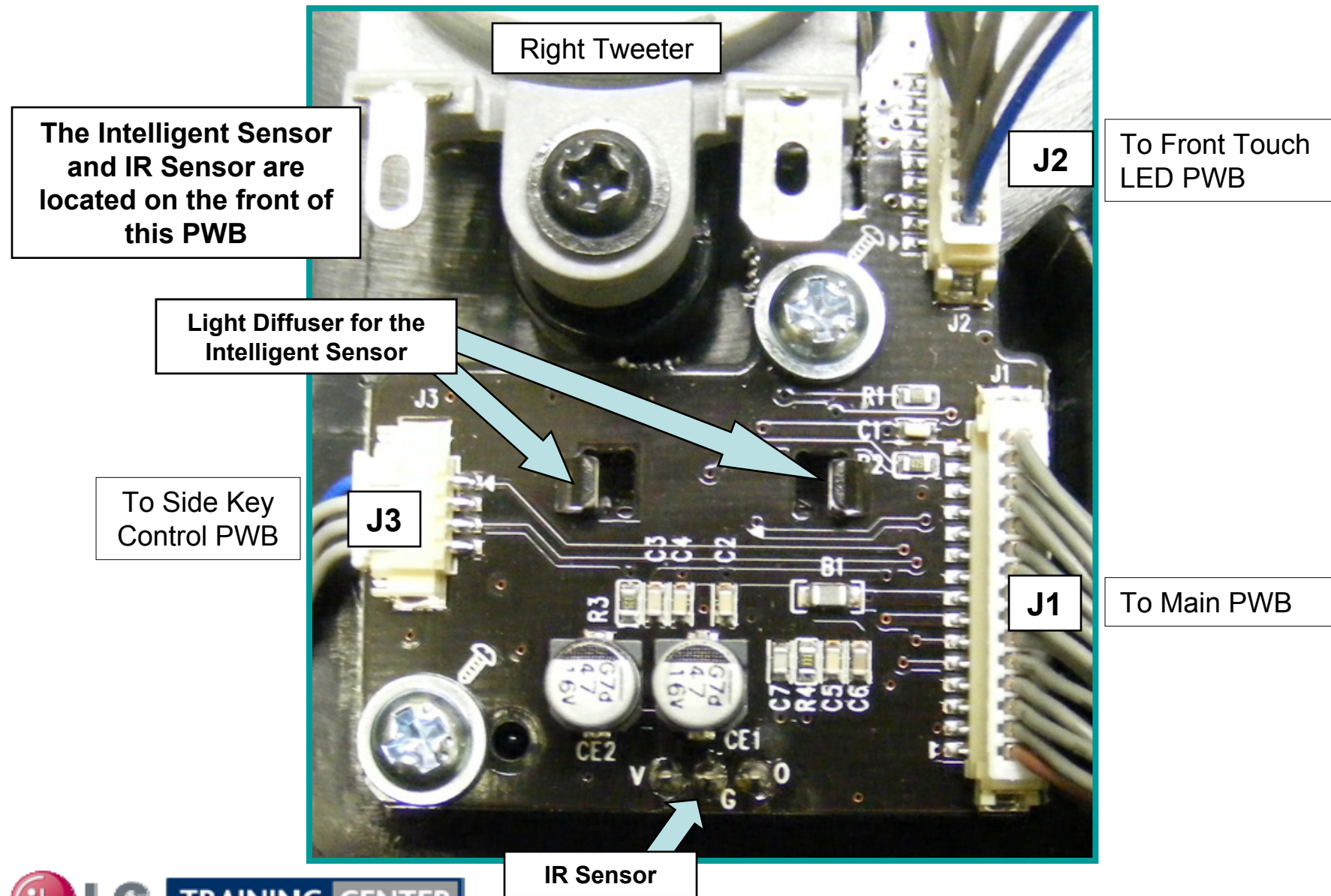
Front Touch LED Connector J1 Voltage and Resistance

J1 CONNECTOR "Ft LED Touch" to J2 "Ft Control PWB"

Pin	STBY	Run
1	3.3V	3.3V
2	3.3V	3.3V
3	5V	5V
4	0V	0V
5	0V	0V
6	0V	0V
7	3.3V	3.3V
8	0V	0V
9	3.3V	3.3V

With all Connectors Removed, no ground return.

Front PWB Assembly Layout



TRAINING CENTER

60

LCD DV 42LG60

Front Control Connector J1 Voltage and Resistance

J1 CONNECTOR "Front Control PWB" to "MAIN PWB" P401

Pin	LABEL	STBY	Run
1	EYEQ-SCL	3.25V	3.25V
2	EYEQ-SDA	3.25V	3.25V
3	Gnd	0V	0V
4	Gnd	0V	0V
5	Key1	3.3V	3.3V
6	Key2	3.3V	3.3V
7	3.3V	3.3V	3.3V
8	5V	5V	5V
9	EYEQ-Reset	0V	0V
10	IR	3.92V	3.92V
11	SPKN	0V	0V
12	Gnd	0V	0V
13	SPKP	0V	0V
14	n/c	0V	0V
15	Gnd	0V	0V

With all Connectors
Removed, no ground return.

Front Control Connector J2 Voltage and Resistance

J2 CONNECTOR "Ft Control" to "Ft Touch LED" J1

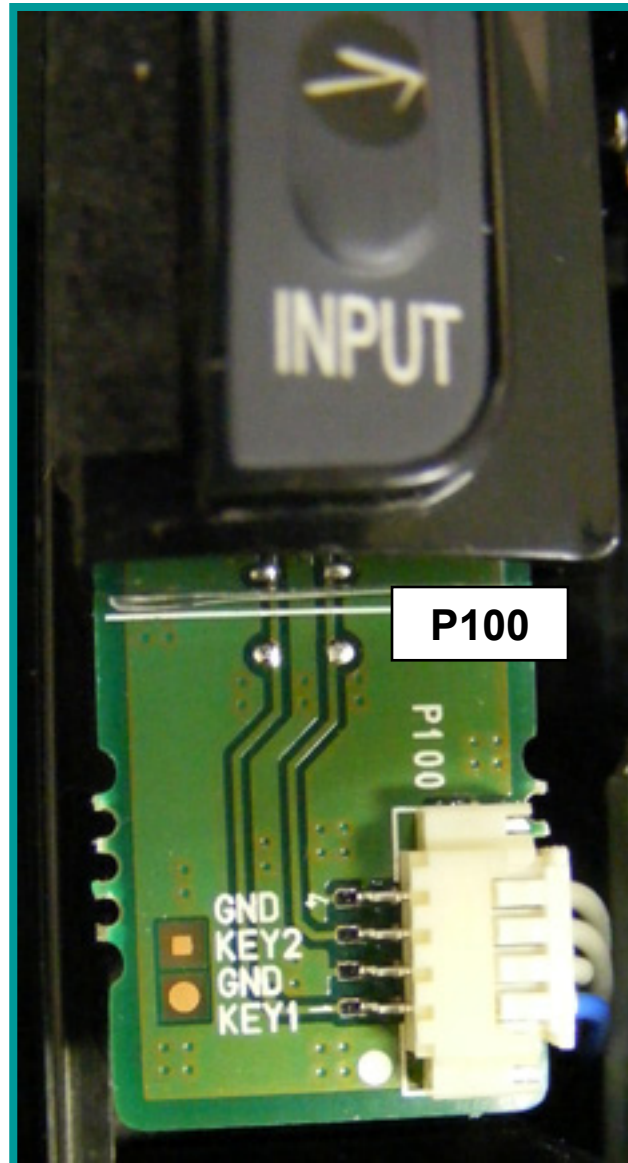
Pin	STBY	Run
1	3.3V	3.3V
2	3.3V	3.3V
3	5V	5V
4	0V	0V
5	0V	0V
6	0V	0V
7	3.3V	3.3V
8	0V	0V
9	3.3V	3.3V

J3 CONNECTOR "Ft Control" to "Side Controls" P100

Pin	STBY	Run
1	3.3V	3.3V
2	0V	0V
3	3.3V	3.3V
4	0V	0V

With all Connectors Removed, no ground return.

SIDE KEYBOARD (FUNCTION KEYS) SECTION



To Front
Control PWB

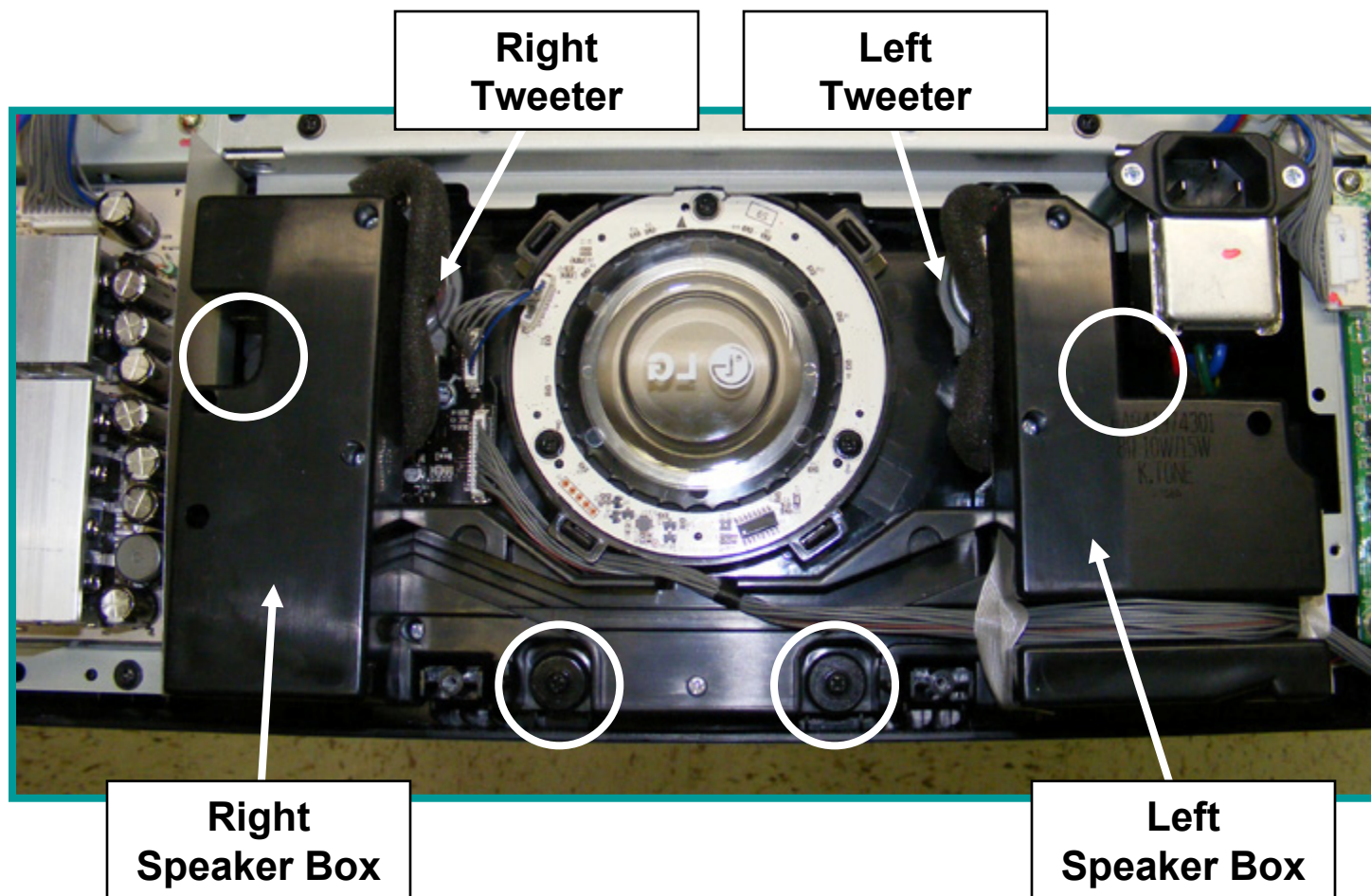
Side Control Connector P100 Voltage and Resistance

P100 CONNECTOR “Side Control” to “Front Control” J3

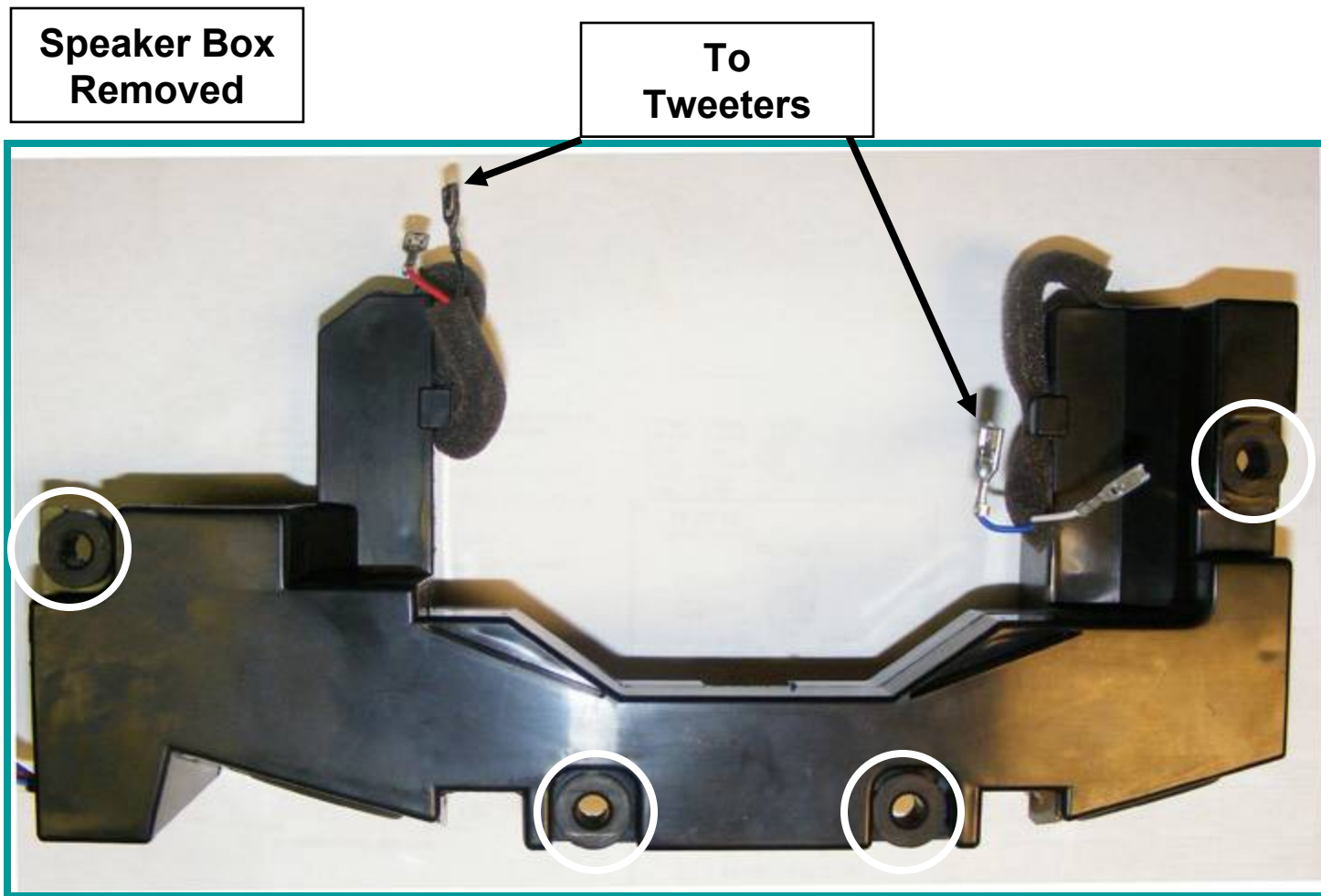
Pin	STBY	Run
1	3.3V	3.3V
2	0V	0V
3	3.3V	3.3V
4	0V	0V

With all Connectors Removed, no ground return.

INVISIBLE SPEAKER SECTION



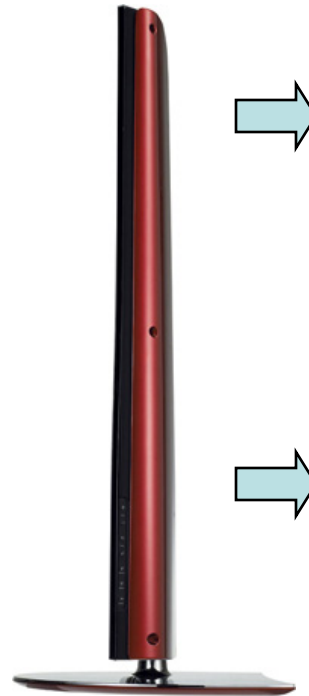
Speaker Box Assembly Removed



To Remove Speaker Box, remove the 4 screws show in circles remove wire harness. Carefully disconnect both Tweeters. Unplug P500 from Main PWB.

DISASSEMBLY SECTION

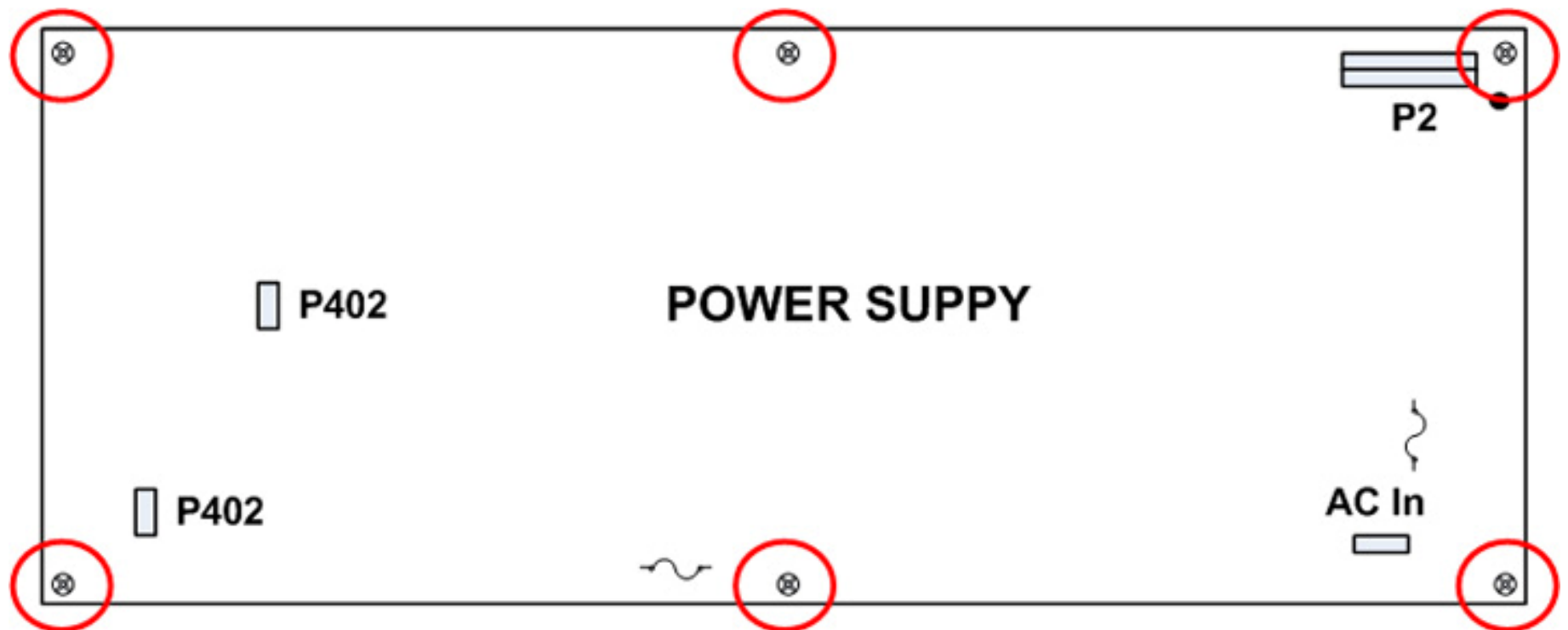
This section of the manual will discuss Disassembly, Layout and Circuit Board Identification, of the 42LG60 LCD Direct View Television.



Upon completion of this section the Technician will have a better understanding of the disassembly procedures, the layout of the printed circuit boards and be able to identify each board.

Power Supply PWB Removal

Disconnect P2, AC In, P402 and P402
Remove the 6 screws indicated below in red.



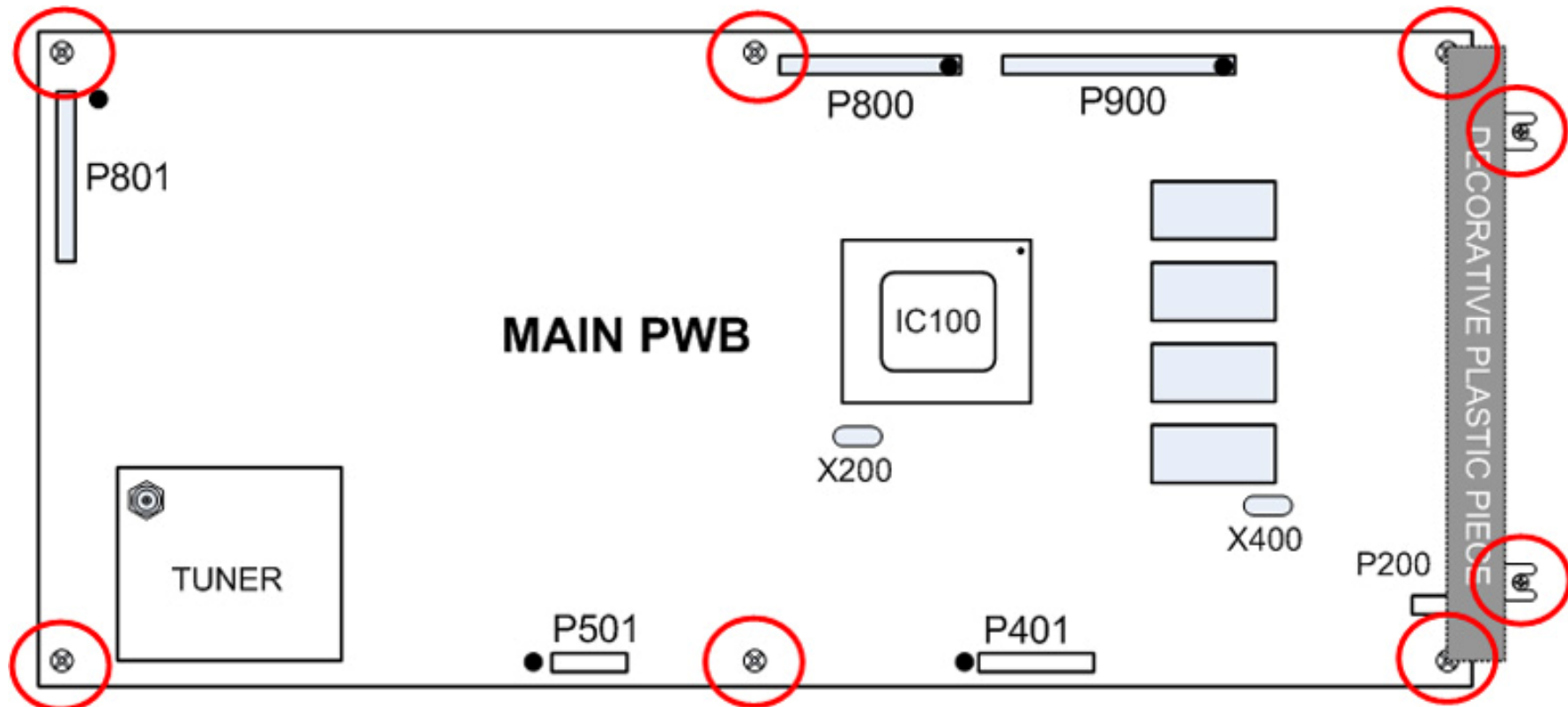
MAIN PWB Removal

Disconnect P401, P501, P800, P801 and P900

Note: In the bottom right is a connector P200. This is an open connection.

Remove the 2 screws securing the Side input decorative plastic piece on the right.

Remove the 6 screws securing the Main PWB indicated below in red.



The Main PWB can also be lifted off the mounting frame by;

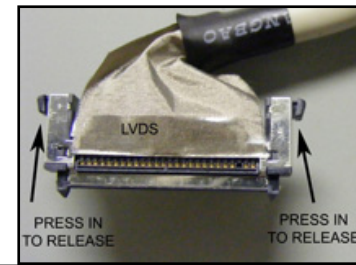
Disconnect P401 and P501.

Remove the 1 screw securing the top mounting frame. Swing the PWB away.

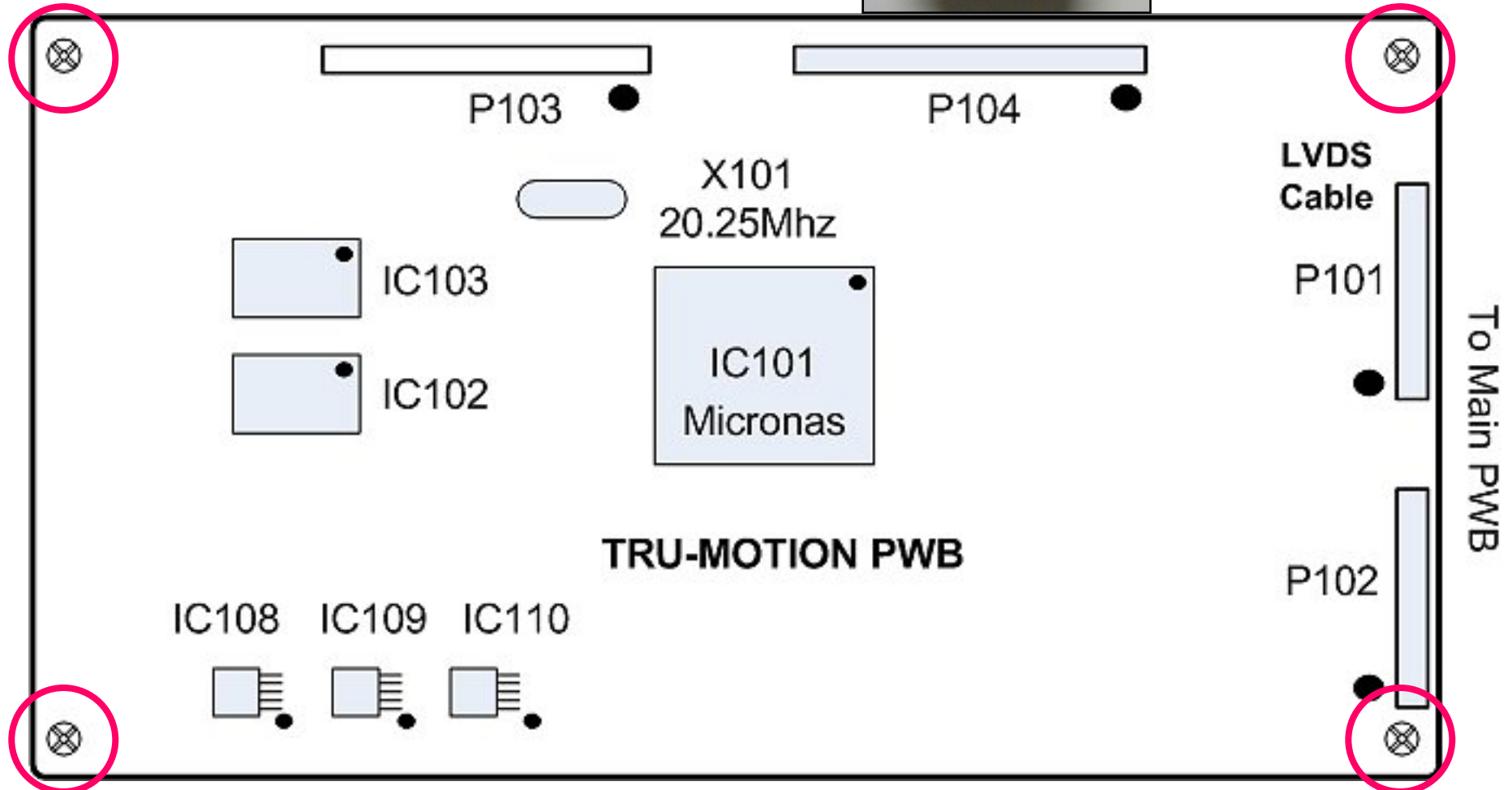


TruMotion PWB Removal

Disconnect P101, P102 P103 and P104
Remove the 4 screws indicated below in red.

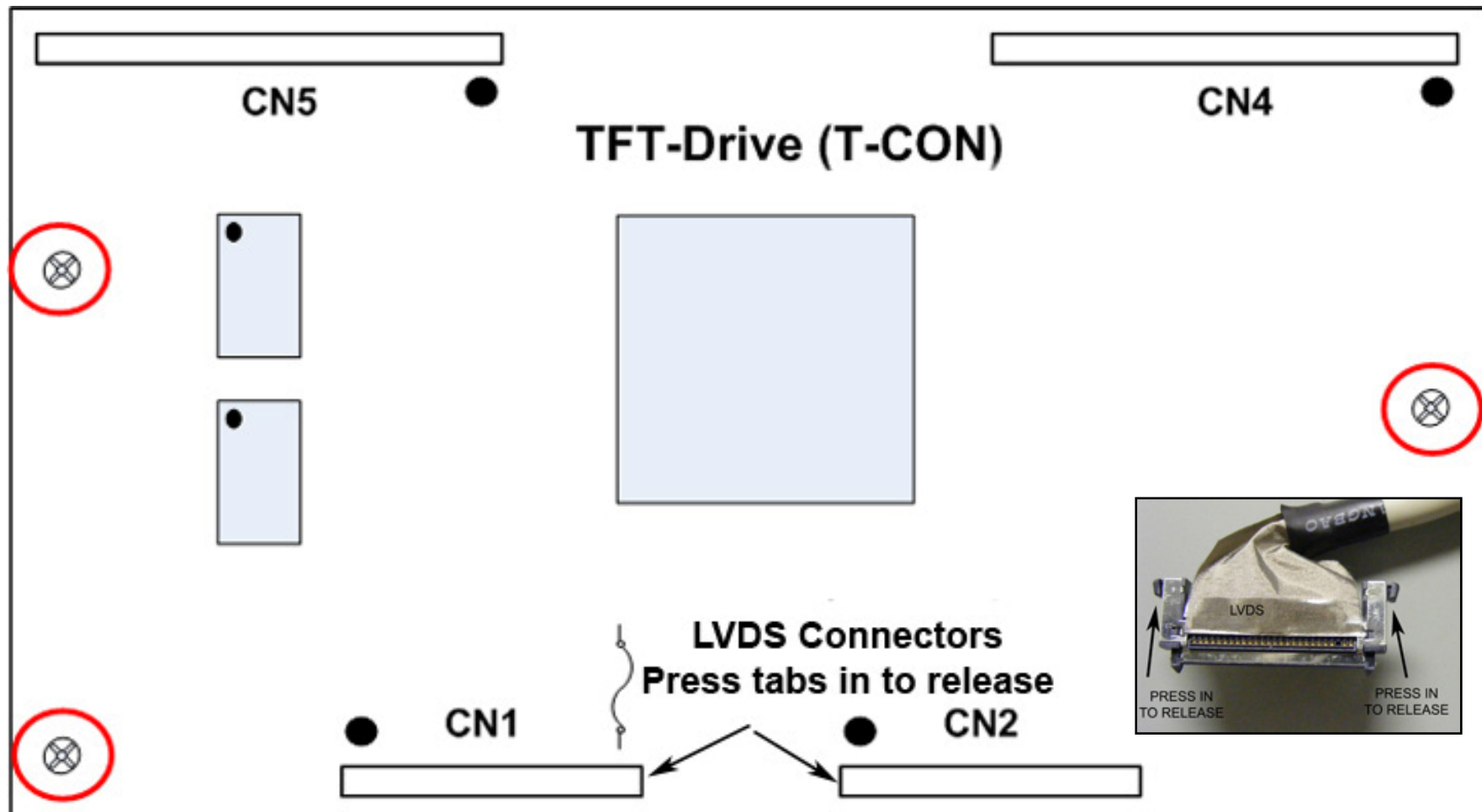


LVDS Cables
Press in from sides
to release



T-CON (TFT Drive) PWB Removal

Disconnect CN1, CN2, CN3 and CN4
Remove the 3 screws indicated below in red.



11 X 17 FOLDOUT SECTION

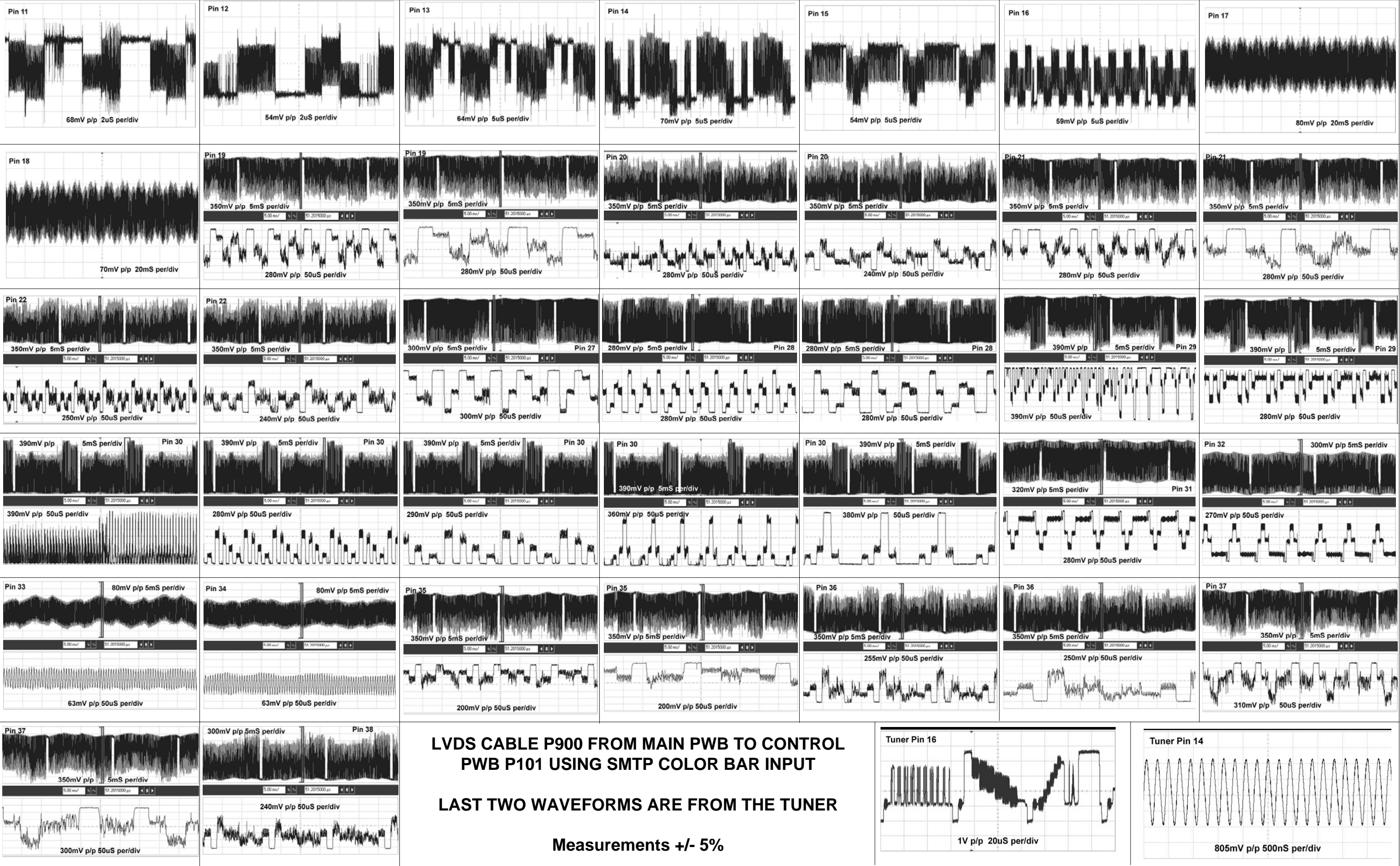
This section shows the 11X17 foldout that's available in the Paper and Adobe version of the Training Manual.

The Adobe version of this Training Manual allows the viewer to zoom in and out making reading of the small text easier.

This Power Point shows a graphical representation of the 11 X 17 foldout page so clarity is limited.

TFT PANEL





42LG60

Conclusion

*This concludes the
42LG60
training package
presentation.*



LG

Life's Good